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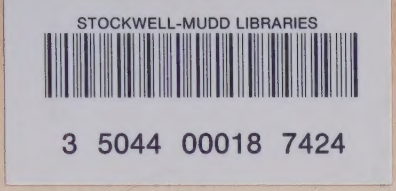

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ITS ORIGIN AND GOAL

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MIND

ITS ORIGIN AND GOAL

BY

GEORGE BARTON CUTTEN

PH.D., D.D., LL.D.

PRESIDENT OF COLGATE UNIVERSITY

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THE present volume is the eighth work published by the Yale University Press on the James Wesley Cooper Memorial Publication Fund. This Foundation was established March 30, 1918, by a gift to Yale University from Mrs. Ellen H. Cooper in memory of her husband, Rev. James Wesley Cooper, D.D., who died in New York City, March 16, 1916. Dr. Cooper was a member of the Class of 1865, Yale College, and for twenty-five years pastor of the South Congregational Church of New Britain, Connecticut. For thirty years he was a corporate member of the American Board of Commissioners for Foreign Missions and from 1885 until the time of his death was a Fellow of Yale University, serving on the Corporation as one of the Successors of the Original Trustees.

TO THE TRUSTEES, FACULTY, ALUMNI, AND STUDENTS
OF COLGATE UNIVERSITY
THIS BOOK IS RESPECTFULLY DEDICATED

PREFACE

IN the preparation of this book I have had the general reader particularly in mind. For many years the subject of evolution has been before the public, and scientists are agreed on this hypothesis as the most acceptable explanation of the method of progress. The study and discussion have been confined almost entirely, however, to the application of this theory to the physical universe, and to the physical part of man. The mental life of man has been largely taken for granted or ignored.

In the discussion of the evolution of intelligence I have tried to take not only a backward look, but a forward one as well. Recognizing the danger of the prophet's rôle, I have endeavored to make that part dealing with the future suggestive rather than dogmatic.

I am much indebted to those special investigators whose labors have been concerned with definite parts of the subjects which I have tried to assemble here, as well as to the pioneers who have made valuable contributions to the theme in its entirety. In deference to the general reader I have left out definite references and footnotes, adding at the end a general bibliography of the works principally consulted in the preparation of this book.

The following persons have generously read the manuscript and have made valuable suggestions: namely, Dean Thomas Wearing, Professors A. E. Alton, W. M. Chester, and H. O. Whitnall, and Associate Professor D. A. Laird, of Colgate University, Professor S. Spidle of Acadia University, Mr. R. P. Bell, and Mrs. R. W. Tufts, to all of whom I wish to express publicly my obligation. In all my writings my wife, Minnie W. Cutten, is always my most severe and consequently my most valuable and valued critic.

G. B. C.

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MIND: ITS ORIGIN AND GOAL

CHAPTER I

WHERE DID WE GET OUR MINDS?

WHERE did we get our minds? The answer to this question will depend upon how we answer the question, "Where did we get our bodies?" To the person who believes in a special, momentary creation for the world as a whole, or for any fraction of the world which needs explanation, the answer is ready and easy, if sometimes unconvincing and usually unscientific. To those who travel the more laborious path of patient study and serious thought, the answer is not so simple; and in addition to the main question, numerous subsidiary and closely related problems are uncovered.

We might simply take the mind for granted and not bother with a discussion of its origin, but such an attitude would stifle all investigation, our body of knowledge would rapidly dwindle, and we should extinguish that which is the boast of our age, scientific investigation. Or, if we should be so crassly materialistic as to think of the mind as only a function of the brain, we should answer our problem by treating it simply as a part of the question of bodily origin. Very

early in the revival of interest in the theory of evolution, it was seen that the problems of bodily and of mental evolution were closely connected, if not indissolubly intertwined, and that the study of the one should involve the study of the other. Not only is the mind dependent upon the body, but one cannot go far in the study of bodily evolution without recognizing also that the mind has had an important influence on the evolution of the body. Notwithstanding this apparently close relationship, we find that the study of bodily evolution has captured the imagination and has demanded the services of thousands of men and women, some of them the most brilliant of their age; while the study of mental evolution has attracted very few. These few, however, in their untiring and scholarly investigations, have done much to add to our understanding of the problem and of the method of solution; but there remains very much yet to be done before we shall have arrived at the same understanding of the evolution of the human mind that we now have of the evolution of the human body.

The results of Darwin's monumental investigations convinced those who studied the problem that human evolution was continuous with animal evolution as far as bodily organs were concerned, and the inevitable corollary that mental evolution must be similarly related was soon recognized and easily

grasped by scholars everywhere. As early as 1863, Huxley said, "I may add the expression of my belief that the attempt to draw a psychical distinction between man and the animal world is equally futile, and that even the highest faculties of feeling and of intellect begin to germinate in lower forms of life." Herbert Spencer recognized that "if the doctrine of Evolution is true, the inevitable implication is that Mind can be understood only by observing how Mind is evolved." J. G. Romanes, after a study of mental evolution in man, concluded, "I cannot help feeling that there is actually better evidence of a psychological transition from the brute to man, than there is of a morphological transition [change in form and structure] from one organic form to another, in any of the still numerous instances where the intermediate links do not happen to have been preserved." So we come gradually down to 1909, when President G. Stanley Hall said, "Some of us are already convinced that the human soul in all its power is just as much a product of evolution as the body."

With the problem of mental evolution always facing the evolutionist, there were two tendencies to a misinterpretation of facts which, in the end, injured rather than helped the solutions. It was recognized that there was a great gulf between animal and human minds, and the tendencies were to elevate the animal mentality on the one hand and to detract from

the human superiority on the other. This was done honestly and unconsciously, for what is more natural than to impute certain lofty, human, mental traits to certain animal reactions, especially when stories of animal intelligence could not well be verified and we could not readily call upon the animals to repeat them? The tendency to impute all sorts of human feelings and ideas to animals and even to flowers and trees is so common as to be an easily recognized trait, and is one of the bases of poetic fancy.

Since the time when physiological psychology became an integral part of mental science, and was inevitably and closely followed by experimental psychology, the study of comparative psychology has been more of an exact science, the definite mental relationship between animals and men has been established, and their reactions to the same stimuli have been measured and compared. If the so-called form of psychology known as Behaviorism shall have any value to psychology, it should be along a line similar to this.

One reason why the study of mental evolution has not kept pace with that of bodily evolution has already been stated; namely, because the investigators so closely connected with the renewed study of evolution in the middle of the last century were biologists rather than psychologists; and the impetus given by them to the study of organic evolution carried that

branch of the investigation along by the very force of its own momentum.

There are two other reasons which may be considered. In the first place, the study of the body is more easily accomplished. One may take a human bone and an animal bone, and, placing them side by side, compare them in size, in shape, in texture, and in use. The next day one returns and they are still there for further comparison. One cannot do that with sensations, emotions, or ideas. The very effort to compare them is likely to distort them. Begin to examine an emotion of anger in yourself for purposes of comparison, and the moment you stop to examine it, behold! it is gone. Even beginning with the simplest psychological processes, it is difficult for us to determine how animals see or hear, or what they see or hear compared with us. The line of least resistance is to confine one's discussion to bodily evolution, and much remains yet to be accomplished in this department; but science, whatever else may be said about it, is never cowardly and never diffident. Thus the greater the problem the more anxious men are to attack it, and it is never a feature of science to deny facts;—they must be explained. Therefore, despite the difficulties involved, there are never wanting men to attempt to solve the problems, and day by day more light is being shed upon them.

The first investigators in comparative psychology

were more interested in perfecting a proper method than in obtaining results. That inevitably caused an initial delay, but in the end it brought more and better results. Shortly after the revival of scientific learning in the middle of the last century, those who began observing animals and reporting what purported to be psychological facts inevitably made mistakes and reported results due to faulty methods of observation and to erroneous interpretations. It was not for many years that sound methods were devised, and only recently are these bearing fruits. Some time will yet be needed before we get the full results.

The other reason why the study of mental evolution has not progressed as rapidly as that of bodily evolution is that objections to the former have been more strenuous. Even some persons who have recognized the arguments for bodily evolution and have accepted the theory have vigorously combated the theory of mental evolution as being incompatible with religious beliefs or aspirations. The claim has been made that the differences between human and animal mentality have been those not merely of quantity but of quality, and consequently that one could not have come from the other. Then, again, it injures our self-esteem and vaunted superiority to be too closely linked to the lower animals. These objections have had weight and have deterred investigation.

Ever since the renewed study of evolution, in the

middle of the last century, there have been those who accepted this hypothesis as the probable explanation of the cosmic process, but demanded an interjection of special divine power at certain periods. Some have considered that only by means of an extraordinary application of such special power can we explain the origin of life or of men or of mentality. There are certain objections to this view: having traced the continuity of evolution through most of the process, it seems likely that the gaps represent our ignorance rather than a break in the process; that these gaps will likely be filled in by later investigation, and we shall then have to withdraw our theory of occasional application of divine power; that it intimates Nature had an imperfect plan or power and needs to be continually renewing and reinvigorating both; and that, if there is a God, he only partially supports his world, or else only supports it a part of the time. It may be that the scientists who have insisted on the continuity of Nature have really been the better theologians.

In regard to the gap between man and the lower animals, Darwin said: "The great break in the organic chain between man and his nearest allies, which can not be bridged over by any extinct or living species, has often been advanced as a grave objection to the belief that man is descended from some lower form, but this objection will not appear of much

weight to those who believe in the general principle of evolution. At some future period the civilized races of man will almost certainly exterminate the savage races of the world. At the same time the anthropomorphous apes will no doubt be exterminated. The break between man and his nearest allies will then be wider, for it will intervene between man in a more civilized state as we may hope even than the Caucasian and some ape as low as a baboon instead of as now between the Negro or Australian and the gorilla."

The religious objection to mental evolution is based on the old fallacy that worth is determined by origin —a fallacy born of aristocracy, but very common in so-called democratic countries. This argument, which is frequently urged as a defense of religion, can hardly be valid among Christians; for did not the Founder of the Christian religion give as the supreme test, "By their fruits ye shall know them"? The religious leaders of his time were very keen to test things by origins. They said, "Can any good thing come out of Nazareth?" When John the Baptist upbraided them, they claimed virtue because they were Abraham's children, but he admonished them to "bring forth fruits worthy of repentance." As that marvellous phrase-maker, Professor William James, has paraphrased it, "Not by their roots, but by their fruits ye shall know them." The dignity of the hu-

man mind, then, in religious as in other relations, is not to be judged by its evolution or creation but by its accomplishments: "handsome is as handsome does."

There is lingering in the minds of some religious people a theory of the soul. I do not know the meaning of soul except as it is synonymous with the word "mind." With some persons, however, there is an indefinite meaning of soul as a part of the existing mind; as that part which deals with religious as contrasted with secular things; as that part which abides after death; and similar or other definitions. At other times and by other persons soul is thought of as the more inclusive term, and the mind which deals with ordinary things is considered a part of the soul. Whatever idea there is of soul, it usually involves very distinctive qualitative differences as compared with any mental quality or qualities of animals, and not infrequently presupposes a separate creation. Psychology, as a science, has not discovered such an entity. The old faculty psychology, which assigned distinct mental faculties to different subjects, having been discarded, we realize that we do not have separate faculties to deal with religious occasions, but the same mental factors are used for all experiences. If we are to accept some of the conclusions of the Freudian school, we have to admit a development of some of our highest faculties through an even more

lowly and humble process than we formerly believed; for Freud considers sexual elements to be indissolubly connected with the beginning and development of many of our higher mental powers and of our loftiest ideals. Even accepting the testimony of the mental journey given by this school, it is not more repulsive than the journey which we believe the body has taken. Nature always works with humble materials, but how great have been her results!

The value and need of a study of mental evolution is apparent. It should be carried on not only as an interesting study—a part of general culture—but also to answer the insistent inquiries from other branches of science which need the information furnished by such study to aid in a further development of their particular invèstigations. I have already referred to the psychic factor in evolution as a whole, and organic evolution is asking further questions concerning the development of mind. In connection with human evolution the adjustment to environment is no longer bodily, but, at least chiefly, mental. If it is necessary for us to go to sea, we do not take the myriads of years necessary to adjust our bodies to a marine life, as the whale has had to do, but we use our minds to build boats. The strife with stronger animals no longer depends upon the power of our blow, the sharpness of our claws and teeth, or the speed with which we can run; but upon our mentality in

inventing guns and powder. In this connection, one naturally recalls the words of Carlyle: "Such I hold to be the genuine use of gunpowder; that it makes all men alike tall. Nay, if thou be cooler, cleverer than I, if thou have more mind, though all but no body whatever, then canst thou kill me first, and art the taller. Hereby, at last, is the Goliath powerless, and the David resistless; savage animalism is nothing, inventive spiritualism is all. Nay, I think with old Hugo von Trimberg, 'God must needs laugh outright, could such a thing be, to see his wondrous manikins here below.' "

We are more apt now to use our minds to change our environment, than to let nature take the time necessary to change our bodies to accommodate themselves to the new environment. Thus we know that the adjustment of the organisms to their environment, which has always been an important factor in survival, is in the human race now a matter largely of the mind, and less and less of the body. Some are willing to go a step further and affirm that bodily evolution in the human species is at an end, that individual mental evolution is finished, and that the next, and perhaps final, step in evolution is social; we are not yet all willing to subscribe to this.

History covers so short a period, short in which to study evolution, that we are unable to affirm much concerning the changes which have taken place in

the human mind or in the human body. Some investigators have used the expedient of studying the savage and lower developed races of men as examples of our forefathers, thinking of them as "our contemporary ancestors"; but this is not safe, for we have no guarantee that the higher developed races have travelled the same path for the last one hundred thousand years that these races have travelled or are now travelling. This anthropological study is undoubtedly valuable, but its results must be compared, as best they can, with the story of our own ancestry.

We must recognize, however, that concurrent and interesting phenomena are to be found in the study of mental and bodily development, and that we cannot well understand the one without some knowledge of the other. The courses of the two are so intertwined and their reciprocal influence is so great that to delay the study of mental evolution is to retard the investigations in bodily evolution. This has become so apparent that at times biologists have felt forced to take up the psychological investigation, a task for which they were not by training well fitted.

A second reason for the necessity of the study, and in a field where such a study, limited as it has been, has already been of much value, is to aid us in explaining some of our human mental processes of today. For years, as the study of mental science has developed, there have appeared certain processes

which baffled investigators and for which no explanation could be given. We have recently found that they can only be explained by a reference to the past. The millenniums of experience through which the race has passed have left their impress; as Anatole France has so well said, "Nous étions déjà si vieux quand nous sommes nés"—we are already so old when we are born. Neither mind nor body can be explained if we think only in terms of the short span of individual life; recognizing man not only as an individual but as a member of a race with a long history, the explanation is less difficult. In animals we see certain mental processes in simple form, which in man are very complicated.

I do not mean to imply that it is only in recent days that this has been recognized. The instincts, as inheritances from the past, have been the subject of investigation for centuries, but until the last quarter of a century they have been overshadowed by the attempt to prove that, different from the animals, man was controlled by reason and not by instincts. When it was declared that man had more instincts than the animals, a stir was noticed among some scholars; but a score of years in the present century has done more to show the dependence of mental states upon past racial experiences than all the years before. We recognize, now, that instincts provide the power which impels us to action, and that reason provides the ad-

justment which is not furnished by the mechanical, instinctive action, in order that the instinctive impulse may reach a more sure and complete consummation.

Two sources, which supplemented each other, have been most fertile in new knowledge for us; namely, the late war, and the investigations of the psychoanalytic and allied schools. The war showed us that the veneer of modern civilization was very thin, and that it required little to remove it and to return man to his prehuman or savage state. Evidence of this was more abundant in the late than in former wars, because larger masses of men were used and the strain on the nervous system, due to the conditions of modern warfare, revealed the weaknesses and made them more easily discernible. It is evident, too, that the comparatively short period of training, which the exigencies of the war made necessary, did not give sufficient time to adjust the mind and nervous mechanism of the soldier to the new conditions which he had to face. The second element, the modern studies in psychology, taught us to read the evidence which the war provided and to deduce more rational conclusions. The evidence was very clear, and it was readily seen that the vaunted mental development of modern civilization, upon which we had depended so much, was really not to be trusted in an emergency; for the experiences of the past five thousand years

had not worked into muscle and nerve fiber, and in the testing days when one was forced to depend upon fundamentals the basis was found to be not the conventions of modern social life but the crude savagery of the pre-human ancestors, who for thousands of years had successfully won the battle against equally savage enemies. In less crude, but no less real, form the strain of modern life is revealing day by day the same prehuman traits, and the failure to recognize them, or, if recognized, the effort to conceal them has wrought havoc with minds not sufficiently strong to stand the pressure. Psychoanalysis has revealed other component factors of modern life beside the prehuman being and the mature gentleman, but of those we do not pause to speak; not because they are not important, but because they do not immediately concern our theme.

The importance of this study may also be recognized when we think of it as a guide to eugenics. Whether we like it or not, the time is coming when we shall consider it just as important to develop and to maintain good human stock as we do now to breed the most desirable varieties of hogs or cattle or sheep. Mental tests recently made in connection with the drafted men of the United States Army have called attention to certain racial stocks of inferior quality, and the glorious idea of the melting pot has proved

even at its best to be a menace, and at its worst a serious means of degeneration.

It is obvious that we cannot use the same freedom in experimentation in human as in animal stock; or, at least, we have not in the past thought it expedient to do so. What information we have obtained concerning human eugenics has come through the investigation of chance matings. The results of these have been very significant, and many lines of procedure have been indicated. It is apparent, however, that in a large way we must look back to the past and judge the future thereby. If we are able to obtain some indication of how the race has advanced up to the present, there must be some clues for future action.

Of course we recognize that modern philanthropy has greatly complicated the problem. All sorts of unfit are now saved, and in many cases permitted to perpetuate their kind. Ten thousand years ago, or longer, the conditions were such that these could not have survived the fierce competition and the strenuous mode of life, and the stock was kept purer and the strongest physically and mentally were the progenitors of the future stock. Careful investigation must be made to determine just who are the unfit—the unfit for the purpose of breeding the best human beings—and these must not be permitted to perpetuate their kind.

There is no doubt but that we must pay attention to the physical, for man is still an animal and very much of an animal; but that kind of physical must be developed which forms the best basis for mental development. The strain of modern life demands this. Conditions of the present must be compared with those of the past; and taking lessons from animal life, past human life, and the present race of men, an adapted type can be produced, just as different kinds of horses or dogs are produced to meet different conditions. To meet this rather difficult demand, there can be no greater aid than that which should come from the investigations into the evolution of the mind.

Mental tests can be of great value. Those who have advocated them most have never claimed as much for them as have their opponents. The latter have demanded tasks beyond the reach of present progress, and because they could not meet the demand they have been condemned. But it is only potential mentality of a certain sort that can be measured. A high score in mental test may be associated with certain deficiencies which would make it undesirable to have such an individual as an ancestor. Emotional stability may be even more important in these days of complicated civilization, or at least as important as mental power—a condition perhaps the opposite of those in a lower form of development.

I simply mention some of the eugenic problems which are facing us and with which we must soon grapple. There are many more; but however complicated and difficult they may be, it seems certain that more and more they must be concerned with mental development, and that a study of the past method of development of the human mind must be increasingly beneficial.

The last seventy-five years have been devoted to a study of the human body and its evolution. We have been for this three-quarters of a century getting the body adjusted to its environment—the environment of modern civilization—and eliminating diseases, many of them the result of an endeavor to adjust the body to its new environment. This task is not yet completed, but great progress has been made, and the work is well under way. The next three-quarters of a century must be devoted to a study of the mind, with an endeavor to get it adjusted, and to eliminate mental diseases incident to the new environment, an environment changing so rapidly as to make adjustment increasingly difficult. To meet this need we are seeing the beginning of mental hygiene and of other preventive measures, as well as many attempts at a curative means for mental troubles.

The fourth result of value which can reasonably be anticipated by a study of mental evolution is additional proof of the theory of evolution itself. Most of

the proofs of human evolution which have so far been presented are connected with the bodies of men, but there is every reason to assume that when as much time and thought have been expended on the investigation of mental evolution as many evidences will be adduced. There are vestigial factors of a mental character as there are vestigial physical organs, the former pointing backward to a prehuman ancestry as clearly as the latter. There are certain human emotions and reactions and reflexes which can be compared with those of animals as surely as the tibias of both can be placed side by side and observed, and the relationship is equally apparent. There is as clear a field for a study of the origin of species from a mental standpoint as there ever was from a physical. As a working hypothesis, evolution as a method of the world's creation, not a cause, is now well established; additional evidence will not only confirm the conclusions of present science, but will also add to our knowledge of how we got our world. This in turn will be valuable in helping us solve present, pressing problems.

It might be well to pause a moment to say that only among those ignorant of the theory of evolution, or among those who intentionally try to misrepresent the theory, is it said that man descended from monkeys or apes or any other living species. It is altogether likely that the distant ancestors of simian and

man were the same, as the ancestors of the horse and the camel were the same. The separation from the parent stock, which was neither ape nor man, took place at least five hundred thousand years ago, and probably at a much earlier time. The gap between the descendants has been continually widening.

CHAPTER II

DO WE HAVE ANIMAL MINDS?

THE scientists, who have worked so untiringly on the subject of organic evolution, have done much not only to prove that the theory of evolution is a working hypothesis but to give the actual account of the method by which the multiplicity of animal life came into being, and they have led up to and included man in their investigations. They have shown that bone for bone and muscle for muscle the bodies of animals and men are homologous, *i.e.*, corresponding in derivation and development; and thus the theory of descent is more firmly established.

This is true in regard to bodies. Is it not also true regarding minds? Do we not have homologous mental factors as we have physical factors? When a dog and a man go out in the cold of winter or the heat of summer do they not both alike feel cold and heat? Are their responses not alike? When struck unexpectedly do they not both start suddenly? Are not their numerous instincts so much alike as to be readily identified? Do they not both visibly show fear, anger, and other emotions connected more or less closely with instincts? Without a moment's hesitation we interpret the dog's behavior by saying he is cold or he is hungry or he is angry, simply by knowledge of our

own behavior when experiencing certain mental states.

One must not be unmindful of anthropomorphism —the psychologist's error—which ascribes human attributes to the lower animals. It is not difficult to fall into this error. A mother thinks of a crying baby as suffering intensely when its mental development is not sufficient to permit of suffering at all, as adults interpret the word. Likewise lower animals are supposed to suffer in the same way as human beings would under similar circumstances. The reactions of animals, or the results of instinct, are not infrequently interpreted as a marvellous display of intelligence. The dog or the horse is credited with extraordinary knowledge and wisdom. These anthropomorphic errors are common, but, making due allowance for them, there are certain animal responses which are undoubtedly similar to human responses under like circumstances, and indicate similar mental processes. Men who have had to deal with animals in a practical way, such as hunters and trainers, owe their success to the fact that they rely on the interpretation of animal emotions on the basis of human emotions. They accordingly look for a certain line of action, and because they are able thus to anticipate it correctly it gives them success, and not infrequently saves their lives.

Where, then, is the difference between men and

animals so great as to lead some to say that there is an impassable gulf, so marked and extensive as to make the theory of evolution untenable as far as the mental life is concerned? This great difference, which some have interpreted as a difference of quality rather than of quantity, is in the power of human beings to handle ideas and to form ideals.

There is no doubt a wide gap between man and the species nearest to him. This gap is so wide and deep that the difference is designated as qualitative. Is there any way of accounting for this? There is: it is due to the ability of the human animal to speak and later to write. The ability to speak opened up a social life for mankind impossible among lower animals. This in itself must have added much to the development of the species. More than that it laid the foundation of a mass of human knowledge which was passed down from one generation to another, plans for the completed structure of which were consummated when writing was discovered and printing was invented.

Moreover, the ability to speak and to write makes the mental distance between men and animals seem greater than it is, for while language is an extremely useful tool it is a very showy one, and is likely to exaggerate the appearance of intelligence of one using it. In some cases, loquaciousness undoubtedly hides a mental defect. A person who has had various experi-

ences, due to changing occupations and acquaintance with different localities, is likely to have his native ability overestimated by his ready tongue. Speech may thus cause an exaggeration of the apparent mental differences in favor of the speaker, but it is nevertheless a most valuable aid to development in the race.

We should recognize clearly the confusion in the meanings of the word "inheritance." There is that mass of knowledge, the gift of the ages, which is handed down to us and taught to us in home, in school, and in university, so that we start where our fathers left off, and go on to higher things. We speak of inheriting this knowledge. This is designated as our social inheritance. Then the physiological characteristics and mental traits which come to us from our parents we speak of as our biological inheritance. It is in the matter of social inheritance that man has the great advantage over his simian cousins, due, however, to his superior biological inheritance.

If we could imagine a human child starting only with his biological inheritance, and entirely devoid of his social inheritance, learning only by experience or by the example of parents who had started in the same way, should we expect a much higher standard of living than that enjoyed by the anthropoid apes? However great the intelligence, we should not expect to see it blossom out in a single individual, if this

individual were devoid of the wisdom of his race. Under no circumstances can we conceive of such a person showing a very great variation from the apes. It has required generations of development, in which the mental life of each generation has been built upon the experience of hundreds of former generations, to arrive at our present state, which shows such an apparently wide gap between us and the anthropoid apes as to lead us to think of the difference as qualitative. McDougall gives us a rather full account of his conception of the "behavior of the natural man," a man living without the aid of and in detachment from all tradition. He pictures him as we imagine the cave man of prehistoric times to have lived, and not much above the status of the gorilla, according to the latest investigations in the mode of living of these apes.

We have the history of Kaspar Hauser, which, if we can separate fact from the entanglement of wild fancy and lurid mystery in the more than one thousand articles written on his case, seems to throw some light on this point. He was found at Nürnberg in 1828, and, according to a letter in his possession, he was born in 1812, and had been left on the doorstep of the hut of an Hungarian peasant, who adopted him and reared him in strict seclusion. He had been kept in a low, dark cell, and had never seen the face of the man who brought him food. He went to sleep after

partaking of a drink given to him periodically, and on awakening found his nails cut and clean clothing on his body. He was considered idiotic, but when taught, was able to learn, not normally but considerably. In the four years of his life after he was discovered, he developed more like a normal child, but his early, violent death put an end to any further research in his particular case. The autopsy on his body revealed a small brain, giving evidence of a lack of development, but without abnormalities. We have the histories of about one dozen other feral children.

This mass of social inheritance, which accumulated more and more and gathered greater momentum as generations marched by, was reason enough for the rapid advance of man, whereby he easily outstripped his less fortunate cousins; after millenniums this advantage has emphasized an apparent mental development, which leads us to speak of the difference as qualitative. It would, however, give an additional advantage, an advantage to which we called particular attention when designating the difference between the two.

Without language, it is difficult, if not impossible, to have concepts; and quite impossible to have any commerce with others regarding concepts. Sign language might suffice to communicate regarding sensations, perceptions, and even instincts and emotions;

but what sign language is able to communicate to us a concept? The same is true concerning ideas and ideals. The whole ideational experience of man is largely, though not entirely, dependent upon his ability to speak and to write. This difference, so boundless in appearance, can be traced back to speech, the beginning of which we undoubtedly find in the lower animals.

Psychologists, however, have not been content with this explanation that the difference is accounted for by the ability to speak, but have sought to trace more definitely the relation between the higher mental qualities, as found in men, and the mentality of the lower animals. Thorndike has contended, with the support of many others, that the relationship can be clearly established. After numerous experiments with lower animals, especially with monkeys, he comes to the conclusion that the higher mental processes depend upon "the number, speed of formation, permanency, delicacy, and complexity of associations." Association adds no new facts; it simply sorts, connects, and makes available what facts we already have. Five hundred new subscribers to a telephone exchange do not increase the number of inhabitants in a town, but they do help in the effective transaction of business. This is the kind of advance that man has apparently made.

That animals have the power of making associa-

tions there can be little doubt, and the higher in the scale, the more easily are associations handled, until the climax is reached in man. Thorndike himself gives us many examples, and Holmes presents us with examples too numerous even to mention. To show the form of the experiment and the responses of the different animals, let me quote a few cases.

Let us note in passing that there are various ideas of proof of intelligence, but it is generally considered that if an individual is able to learn from experience, and to modify his behavior, whether instinctive or otherwise, on account of this experience, we then have an indication of intelligence. Based on this a number of experiments have been performed by which animals have been tested, and different degrees of intelligence have been thereby shown. It has even been claimed that the amoeba learns from experience.

Professor Yerkes took a crawfish and placed it at one end of a tank, some food being placed at the other end. The tank was divided longitudinally by a partition. If the crawfish went to one side of the partition it entered a blind alley, if to the other side it reached the food. After some time and many trials it invariably took the side which led to the food. When the blind alley was changed to the other side, the crawfish eventually learned to change its path so as to reach the food.

Professor McDougall put food in a box which

could be opened only by pressing down a board, turning a latch, and depressing a lever in order. These things his dog learned to do by the trial and error method, and eventually was able to accomplish this feat rapidly and correctly.

Professor Thorndike's experiments with monkeys were still more successful, for monkeys showed a decided superiority over cats and dogs. By means of food rewards, they were encouraged to attempt the opening of boxes fastened by bolts, bars, hooks, latches, or string, and not only accomplished the task comparatively quickly, but remembered how to repeat it after intervals as long as eight months.

In none of these cases did imitation play a very important, if a fractional, part; neither was there any suggestion toward success through reasoning, for the latter includes a comparison of past experience with new and more or less difficult phenomena.

There is an incident reported of a gorilla trained by Miss Cunningham in London. One day, when the gorilla was young, Miss Cunningham put on a light dress preparatory to going out. He begged to be taken on her lap before she left, but was refused on account of being dusty. Thereupon, he threw himself upon the floor and sobbed like a child. No heed being paid to him, he got up, found the daily paper and spread it over her lap. Similar cases have been recorded.

Professor Thorndike further calls attention to the

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fact that a characteristic of human thinking is the finer analysis of situations, and the division of situations into smaller parts. Animals, he thinks, perceive things more as a whole, while the power of human discrimination causes the associations to be more numerous and delicate; consequently more refined relations appear. This finer analysis is in harmony with the whole process of evolution as we see it in the bodily development.

A young child grasps things in the gross very much as an animal does, and shows its development by the finer distinctions which it is able to make in definitions and in rational processes. James's famous phrase in describing infant impressions as a "great, blooming, buzzing confusion" shows the start of mentality as he conceived it, and that progress of development naturally came through differentiating the elements of which the confusion consisted.

We can see how the finer analysis, characteristic of the human animal, and the additional number and delicacy of associations, which is another characteristic of human life, might work reciprocally in the development of each. With the disintegration of mental processes into more elemental factors, it is most natural that associations should become more numerous and more refined, and with this kind of association the mental processes would have to be smaller and more particular. When the experiences become more

definite and less confused, other phenomena of reasoning readily appear, all based on a comparison of one with the other according to the well-known rules of association, for it seems impossible for a large body of experiences to remain quiescent; the mind naturally brings them together in some form of comparison.

Even children, whose conclusions are usually erroneous, show the faculty of separating experiences into classes, and of comparing them in a way indicating the beginning of reasoning, which later exhibits its full power when the experiences are better classified and when others which are necessary to a full knowledge of the subject are obtained. When these do appear, the mental processes seem to show new powers, so that the difference between the new condition and the former impresses itself on one as being qualitative. "The intellectual evolution of the race," to quote Thorndike again, "consists in an increase in the number, delicacy, complexity, permanence, and speed of formation of such associations. In man this increase reaches such a point that an apparently new type of mind results, which conceals the real continuity of the process."

We must recognize that if we prove definitely that the mental life of man and of lower animals is similar in kind, and that the difference is only one of degree, it does not prove that man received his mind by the

process of evolution. It simply removes one objection—and the principal one—which has been raised against the evolutionary theory when applied to the mental life of mankind.

We have found that the mental differences between animals and men under close analysis seem to be quantitative rather than qualitative, and that they are found most frequently in the different forms of association of experiences. When speaking of the development of language from a common source, Professor Sayce said, "Differences of degree become in time differences of kind." Let us admit, for the moment, that the difference as we see it today is qualitative; is that admission absolutely destructive of the evolution theory as applied to mental life, and must we look elsewhere for an explanation? I believe not; this difference might almost be expected. Variety seems to be the aim of nature, and the greater the variety the more natural are the phenomena.

The terms "survival of the fittest" and "natural selection" seem to have awakened an antagonistic reaction on the part of many people, especially those who oppose evolution on supposedly religious grounds. If there is any aim in evolution, any design in nature, what could be more rational, moral, or religious than that the fittest should survive? Our experiments in making possible the artificial survival of the unfit have not been so successful as to make us

believe that the doctrine of survival is wrong. If God is in his world working through nature, we should expect that he would ordain that the fittest should survive. Is not that also the Christian doctrine of immortality? The conclusion should not be drawn from this that I believe the Darwinian conception of natural selection to be the one and sufficient explanation of evolution, for evidently many other factors enter in; but there seems to be no just cause for the antagonism which has been engendered to it as one factor.

Nature seems to go about this task in a roundabout way. The primary aim does not seem to be to produce better products, but different ones; however, when all the different ones are produced, the best one, *i.e.*, the fittest out of all the varieties, is the one which survives. This lust for variety, which is so apparent as to need no proof, is the explanation of the differences, qualitative or quantitative. It is for this reason that I say that the widest differences might be expected and might seem most natural.

Spencer's definition of evolution is surely cumbersome, but valuable after all. Said he, "Evolution is an integration of matter and concomitant dissipation of motion, during which the matter passes from a relatively indefinite, incoherent homogeneity, to a relatively definite, coherent heterogeneity, and during which the retained motion undergoes a parallel trans-

formation." The essence of this definition is that there is a continual change from the homogeneous to the heterogeneous, from the general to the special. This change is practically always in one direction—from the coarser to the finer, from the lower to the higher; and after an organ or a function progresses through several stages, it can scarcely be recognized as of any relation to its prototype, the difference being not simply quantitative (although it may be only that) but qualitative.

Organic evolution teems with cases of this kind, and they may be used as examples to prove the fact, and as analogies to point to the method. Literally thousands of cases could be presented, but we must content ourselves with mention of only a few. Since the early development of the vertebrates, practically no new bones have been added; but many of the bones have very different uses and appearance. Even in mammals it is difficult to realize that bone for bone they are the same, and that they can be so readily compared. Take for example the three little bones in the middle ear, known as the hammer, the anvil, and the stirrup. Early vertebrates had no middle ear, and consequently could not have had these bones. Though it is true they did not have these identical bones or any bones used for this purpose, there were three little bones used in the articulation of the jaw, which are not found in man. What has happened? In

human beings they have moved up to perform a higher and more specialized task in the process of hearing. As far as use is concerned, the difference is qualitative; but they are corresponding bones in the different species. To refer to another part of the ear; the eustachian tube, we are told by biologists, has been developed from the first gill slit of the fish. This little passageway, from the throat to the middle ear, permits the pressure of air in the middle ear to be equalized with that outside, and hence makes hearing possible, or, at least, makes it keener. No one would say that either in form or in function the two organs are now alike either quantitatively or qualitatively.

Let us take one other example which is more apparent to most people—the use of the fore limb. With practically all vertebrates, except man and the anthropoid apes, the fore limb is used principally for locomotion. Sea animals use it for propelling themselves in the water, and land animals for walking; the fish as a fin, the horse as a leg. Compare them with the delicately constructed and marvellously useful hand of a human being; yet bone for bone they are similar. Imagine the perch with his finger nails as sharp spines, or the horse with one finger nail as a hoof trying to thread a needle or to play a flute! The progression has been from the homogeneous to the heterogeneous as far as structure and use are con-

cerned, yet no new material is added. The difference between the paw or hoof of an animal and the hand of a man is such as might well be called qualitative, but we can trace the descent fairly well.

Let us take one further illustration, this time from the mental realm. We are hearing much today of sublimation. What do we mean by that? It is a process by which one mental factor, which seems for some reason to be less desirable or expressible in its present form or use, can be repressed, and a new and more desirable outlet found. It is most commonly applied to instincts. For example, if the sexual instinct is found to be too strong, or exercised in a way not compatible with the best interests of the individual, by repressing this expression and at the same time providing some other creative function, the instinct may with advantage express itself definitely and continuously in the new form. This creative work may be the painting of a picture, the writing of a story, or the building of a house. This is very similar to what Dr. Thomas Chalmers called in the language of his day, "the expulsive power of a new affection," and the results, expressed in the religious experience of his time, were practically identical. To be able to change the direction of the expression of so strong and vital an instinct as that of sex shows a tendency to variety in natural processes, a progression from the lower

to the higher, and a result to be classed as qualitative rather than simply quantitative.

From what has been said in the first part of this chapter, it does not seem that the difference between animals and men is a matter of mental quality; but suppose that we should decide that it is, that does not seem to shatter the evolution argument. Association of experiences, so common in animals, may not seem much like the higher mental and moral products of man, although association always shows itself in these in some of its various forms. The difference, as great as it may be, is in the right direction. In being more diversified, and in serving a higher purpose, it is just what we might expect, if there is really design in nature, if there is a rational God, guiding in a large and God-like way the destiny of his world.

There are some, however, who go a step further and contend that the impassable dividing line between animals and men is not in the mental but in the moral realm, and that man shows his special qualities by being a moral and religious being. Years ago Henry Drummond called attention to the fact that self-preservation was not the first law of nature, but that altruism, as shown in mother love and in the instincts of the herd, was more powerful. It is inevitably so; for if not, the race would perish: the parents must be willing to sacrifice themselves, even unto death, if the species is to be propagated. These al-

truistic impulses or instincts are the foundation of morals in the human being, and they are very clearly seen in the animal world—sometimes more clearly than among human beings.

We realize that moral judgments are not different from other judgments, for the same psychic processes are in use in both; but the sense of moral obligation is at least stronger if not unique in human beings. What has already been said about qualitative differences regarding mental processes is equally true regarding moral experiences. This uniqueness is no disturbing factor in the theory.

There is one other point about the moral life as found in man which seems significant, and this significance shows itself in two ways. The evolution theory places the moral life at the pinnacle of development, and if there is such a thing as design in nature, then the conclusion from this theory is that the aim of creation, "the last of life for which the first was made," is the moral life. Any theory of creation does not, or cannot, so dignify or emphasize the moral life as does evolution. It is, of course, impossible for us to say that there will not be a higher and more God-like development; but the moral and religious elements of human nature are evidently the highest development up to the present time.

The other significant statement is that we practically know that the moral and religious life is the

latest development. How do we know this? If the moral element in mankind were the result of creation, and as important as we believe it to be, we should expect it to be so created as to be the most firm and steadfast part of our lives—that supposition seems reasonable. As a matter of fact we find the very opposite to be the case. In cases of accident to the brain, brain diseases, and mental troubles, the moral and religious elements seem to be the first ones to go. Examples of this are too numerous to need citing. Persons who have been the most exemplary morally and religiously, after mental troubles frequently lose all semblance of morality, and if religious emotions remain they are grotesque and degrading.

This is not only true individually, but it is true of groups of people. The recent study of the crowd shows it to be unmoral rather than immoral, and not restrained by moral ideals. When men operate as a group they are taken back many millenniums, for the gregarious instinct is much older than they are—it carries them back to a time before morals had developed, and they act accordingly. The mob is not only unmoral, but another of its traits is that it is destructive, never constructive: a characteristic of the herd. Thousands—yes, millions—of years are sloughed off in a few minutes, and the fundamentals of the gregarious instinct are apparent. This is another indication that morality is the late product

of the process of evolution; but, as we shall see later, it developed within the herd when intelligence had advanced considerably. When a group of people drops the veneer of civilization, and in reality, of humanity, and becomes a part of a mob, we ordinarily say of the individuals that consciousness is dethroned and subconsciousness plays the leading rôle. This gregarious instinct, rooted and grounded in nature before consciousness was vigorous, is now of subconscious origin and operation.

There are other ways in which we may examine the subconsciousness to obtain a glimpse of the history of development, chief among which is through hypnotism. While it deals with the subconsciousness, hypnotism is a communication between individuals, and not connected with a group: the keynote of it is the *rapport* between two individuals only, the subject and the operator. In hypnosis the moral factor is prominent, for the operator has complete control over the subject, except that the latter refuses to obey any command which does violence to his moral nature. He is as immoral in hypnosis as in waking life, but not more so.

Individualism is a later growth in the human race than gregariousness, for individuals are always liable to be caught into a mob and to revert to primitive conditions. Extroversion, when the mind is actively occupied with objects and incidents outside of itself,

is a characteristic of youth—it is collectivism; introversion, when the mind is turned in upon itself for examination, contemplation, or brooding, is a more mature stage and characteristic of age—it is individualism. Youth wants company and most easily forms mobs—college students, for example; age appreciates solitude. The individualism which is a prominent feature of hypnosis is naturally associated with the moral nature, for both developed late and are more or less connected. We therefore find them inseparable in the hypnotic condition.

Even with the development of morals, of which we pride ourselves at the present time, they are still largely an individual matter; at least it may be said that individual morals are far better than those of the group. As a group, or nation, we permit immoral practices in our governments that we would not countenance in individuals, and smile at them in an indulgent manner. We may even applaud plunder, theft, dishonesty, lying, and sharp practices on the part of our government in its dealings with other nations: practices which we would not, for a moment, condone in an individual. The group still exhibits the unmorality of the early gregarious instinct, the individual the morality which developed late in the history of the herd, and was carried with him when his ancestor separated from the herd. This morality,

valuable as it is, is yet very unstable on account of its late appearance.

The history of nations shows that under the severe strain of higher civilization the morality of the nation is the first element to be affected, and the moral breakdown the first symptom of degeneration. Some students of history opine that the strain of modern civilization is increasing so rapidly that it is doubtful if our mentality can stand under the pressure. They even go so far as to say that there are serious symptoms of a moral collapse, the inevitable harbinger of the fall of any civilization. Whether or not this interpretation of present conditions is true or false, the fact remains that the instability of the individual and the weakness of the collective moral and religious life are two of the chief characteristics of modern life. Creation cannot explain this, but evolution can. As the latest development of the process it is naturally the most unstable. Those mental processes, sometimes called vegetative, which we share with the lowest forms of animal life—perhaps with the vegetable life—persist when all the higher mental processes have ceased and when life is hanging by a thread. They are coexistent with life itself; life is largely conditioned on them. The processes which we share with higher animals only (*e.g.*, mammals) are well ingrained into the body, but less so than those just mentioned. The processes which are ap-

parently unique in human beings are more unstable, not having had time yet to become an indissoluble part of our organism, and being more or less on trial.

Even if we admit the assertion that the moral experiences of mankind are unique and vastly different from those of animals, that these are the distinguishing features of human beings, it comes in the end to be an argument for the evolutionary theory rather than the argument against it which it is intended to be. I do not believe that the moral life of man shows any qualitative distinction between him and animals, but if it did it would not militate against the evolutionary theory.

Among those who are considering the philosophical aspects of evolution, considerable emphasis is being laid upon the conception of isomerism. According to this theory, out of electrons, which are quantitatively and qualitatively alike, atoms are formed which are qualitatively different, on account of the different arrangement and grouping of the electrons in space. Similarly, out of atoms which are alike in quantity and quality, substances are formed which are different in quality. Thus the process ascends through the inorganic, the organic, the mental, and the moral realms. The process creates new values out of like elements all the way along by the ever increasing complexity of the combinations. Here, again, qualitative mental differences are dissolved when we

seek the elements out of which they are formed, and differences are found to be due to a variation in arrangement and combination. This is but another way of presenting the dissimilarity between man's mentality and that of the lower animals, but it brings us to the same conclusion of elemental similarity.

CHAPTER III

IS MENTAL DEVELOPMENT LIKE THAT OF BIOLOGY AND HISTORY?

A. Brain and mind.

WHATEVER our theories may be concerning the relationship, there is evidently a close connection between the mind and the body. Up to a few years ago it would have been dogmatically affirmed that we know of no mental action except as it is manifested through speech or some other bodily movement or experience. Now, however, there seems to be a growing belief that telepathy, the transference of thought without the use of the ordinary means of expression, is being established; and, although we are as yet ignorant to a large extent of its laws, the fact of telepathy is now more widely accepted on account of an increasing amount of evidence. Except for the facts of self-consciousness, and our hardly yet established knowledge of telepathy, we have to gather our ideas of the working of the mind from the related experiences of other persons, or from their behavior. It is necessary for us to correlate all of the facts gathered from all sources in order to obtain an accurate and scientific description of mental action.

There should be some delimitations of the word "mind." Some persons restrict the term to include

only the activity of self-consciousness, and limit it to the experiences of human beings. Others make it so broad as to comprehend all mental and nervous reactions, from the loftiest ideals of the most highly developed man to the simplest reactions or trophisms of the lowest forms of life. The difficulty is found in trying to discover some method of demarcation by which a line can be drawn, above which we can say "this is definitely mind," and below which we can clearly designate nervous reactions. The higher mental processes are clearly made up of factors among which are simple nervous reactions, and one phase shades into the other so closely as to make many stages of development inseparable. Especially if we hold to the theory of the evolution of mind, it becomes increasingly difficult to make sharp divisions, or to say where the highest mental functions begin and the lower ones end.

Notwithstanding this and similar problems, it should not be difficult for us to differentiate between body and mind; but as soon as we do we are faced by the age-long discussion of the relation between the two. Some biologists and physiologists find no difficulty, for they use the term "mind" and "brain" interchangeably, the former evidently being to them but the product of the latter, analogous to the action of other bodily organs. Some recent writers on evolution apparently take this position. Similarly, but at

the other extreme, there are certain philosophers who do not recognize any such entity as brain, except as a product of mind, and as a manifestation of mental action. The great mass of people, both scholars and laymen, take the moderate position of recognizing both mind and brain, and of believing some sort of relationship exists between the two, making them more or less interdependent, and capable of reciprocal action. Such a position seems to be not only the common sense one, but that one which is most in accord with scientific investigations and conclusions.

It is the reciprocal action which is of most interest to us in our present discussion, and there are certain parallelisms between the development of the brain and that of the mind which are enlightening. I am using the term "parallelism" in this chapter in its general sense, and do not wish it even to suggest the doctrine of "psycho-physical parallelism." As already noted, those who have worked on the subject of bodily evolution have progressed further than those who have dealt with the mental side of the question; and, if there are indeed parallelisms in the development, we may expect to benefit from the results of their investigations, and to make fullest use of the help received from this source. For example, we have a certain parallelism between the size of the brain and intelligence. This is, to be sure, a rough form of comparison, and one which would naturally be made in

the early stages of the investigation, before finer differences could be noted.

Let us look at the comparative size of brains. Man has a larger brain than any animal except the elephant and the whale, but when the size and weight of the brain are compared with the size and weight of the body, man's brain is several times that of the lower mammals. There are startling differences between men of the same race, and as great differences between the average brain size and weight of different races; but even the lowest races are far superior in this respect to the highest apes—the size and weight being at least one hundred per cent greater. In fact, this enlarged brain seems to be the chief anatomical difference between man and the anthropoid apes. Elliott Smith says, "Man at first so far as his general appearance and build are concerned, was merely an Ape with an overgrown brain." It is largely by the brain capacity of the fossil skulls that anthropologists have been able to differentiate them as belonging to men or apes, and to classify the specimens already discovered as belonging to the present species or as intermediate species between men and apes.

Some anthropologists have laid considerable emphasis upon the fact that when man assumed an erect posture it relieved him of the heavy muscles of the jaws and neck. Up to this time he had to do most of his work with his teeth, but the freedom accorded

to his hands relieved him of this necessity. Far lighter muscles are required to hold the head erect than to hold it bent forward. The chief interest in these facts to us is that these heavy muscles prevented the skull from expanding except in one direction. As a result, the sutures in the upper part of the skull of anthropoid apes close early, while in man they do not close until he is about forty years of age. In thus admitting of the expansion of the skull an enlarged brain was a possibility if not a probability.

Perhaps one should not lay so much emphasis upon the size of the brain as a whole (for the largest human brain of which we have any knowledge is that of an idiot) but upon some parts of the brain the presence of which more especially parallels the possession of higher mental qualities. Leaving aside the lower forms and taking a comparison of the brains of vertebrates, one finds not only an increase in the size of the brain as an advance is made from fishes through reptiles, birds, lower mammals, and apes to man; but more especially a development in the size of the cerebrum and even more of the frontal lobes, connected in no uncertain way with the distinctly human mental characteristics. The advance is shown, not so much by a changed form as by an addition to the lower forms, until the forebrain, instead of being about a quarter of the whole brain, as it is in fishes, becomes nine-tenths of the whole in man.

This same factor, the size of the forebrain, or in fossil skulls what amounts to the same thing, the space in these skulls occupied by the forebrain, is the determining factor in the classification of prehistoric man. On this basis, not the size of the brain itself, but of the frontal lobes, the race of men called Pithecanthropus erectus, the remains of which were found in Java in 1891 and 1892, is considered the lowest of prehistoric human beings yet discovered; and Homo Neanderthalensis, specimens of which were discovered in different places in 1828 and subsequently, the highest; but both are of distinctly lower type than the present species. On the same basis of comparison, the Crô-Magnon man, the first specimen of whom was found in and named after the town of Crô-Magnon, France, in 1868, is classified as the first representative of the present species, Homo sapiens. Even if the Javan relic is considered the lowest form of human being, the brain capacity of this skull was about 950 c.c., which brings it within the range of variation of the present human species; while the largest recorded brain capacity of a gorilla, whose body would weigh twice as much as that of a human being, is 650 c.c. No one would claim that this increased development of the brain or of any of its parts was the only cause of mental development in the vertebrates, yet it seems to be, without doubt, the principal one.

Did time and space permit we could trace the size of the brain from the time of its first appearance, through animals lower than vertebrates, to show that what has been said of vertebrates is equally true of them; but we are especially concerned with the evolution of human intelligence. Nevertheless, the same fact is noticed; namely, that in a general way the development of a varied mental capacity parallels the comparative size of the brain. The argument for evolution from embryology is as valid when applied to the brain as to the other portions of the body. In the human embryo the brain develops very much along the line of the animal world as a whole, the cerebrum and especially the enlarged frontal lobes being the last to make their appearance, while a primitive brain corresponding to that of lower forms of animal life appears early.

The parallelism between intelligence and an enlarged brain is instructive when viewed from the standpoint of the evolution of intelligence, but the development of certain brain areas which minister to certain mental functions makes the argument more detailed. The parallelism shows itself in the fact that the particular brain areas are developed in chronological order paralleling the appearance of the mental functions which are naturally supposed to have developed. For example, we find the area of the brain concerned with speech, which is comparatively small

or absent in the higher apes, developing suddenly in the lower men. Smith says, "The endocranial cast of Pithecanthropus [the Javan skull supposed to be that of the lowest human being known] reveals a localized and precocious expansion of those areas of the brain which we associate with the power of articulate speech."

It is not unlikely that the power of articulate speech was one of the chief factors in the rise of man to his human status. In connection with this there are two things to be noted: first, that the power of speech depends not upon the vocal organs, which were well developed in the apes, but upon the brain and mind adjustments and progress; and second, that the development of the centers of motor speech in the brain was not sufficient in itself, but certain co-ordinate and related centers had to be developed before the motor speech centers could function.

There are some anthropologists who consider that the ancestor of man was not so highly specialized as his cousins, that the development in his case was more general, and that as a result he was not side-tracked. The first impetus toward superiority came when he adopted an arboreal life, which required and forced agility, and transferred emphasis from the sense of smell to that of sight and hearing; and that the combination of the enlarged use of these functions was responsible for the development of

attention and higher association which were necessary for the use of speech.

Perhaps it was not the arboreal life in itself which was valuable, so much as the life to which the arboreal was an introduction. After an education in the higher branches, the race was forced to descend from the trees, on account of the destruction of the forests by climatic conditions. Forest animals are notoriously deficient in sight and hearing; but the life in the open spaces, forcing upon our ancestors the erect position in order to obtain greater speed, gave the race better defensive powers, due to the freedom to carry weapons already made and the ability to use them effectively, and conferred upon the individual with superior sight and hearing an advantage which would naturally show itself in the struggle for existence. The erect position forced his nose off the ground, where smell had been more effective, and enabled him to see over the bushes which grew on the deforested plains. He could see his prey and his enemies before they could smell him. This was fortunate for the preservation of the species, for the very fact of his being on the ground instead of in the trees added greatly to his own danger and the danger of his offspring. All his superior mental ability was called into action to accomplish the feats which would be required of him, and considerable advancement must have been made about this time in his

mental equipment concerned with an increased brain capacity, to have enabled him to meet the demands made upon him. Going up into or coming down from the trees was not sufficient explanation without an internal change of considerable amount.

The portion of the brain most frequently referred to as the basis of higher mental qualities, the one which finds its greatest development in man, is known as the association area. The growth of a part of the brain receiving impressions from different sources and so correlated that one impression potentially revived another was needed for higher mental action. In the cerebral center there are portions largely made up of fibers, called the association area; but it is named chiefly in analogy to the mental experience of association of experiences. Physiologists sometimes speak as though we knew all about the anatomical structure of the association area, and that the psychological conception of association of experiences was derived from it; but the opposite is more nearly the case. Yet we must all admit that association of experiences with corresponding comparison and judgment is necessary before higher mental functions are noted. So far as we know, the physical basis of association is in the cerebral cortex, and the expansion of the cortex naturally ministers to the development of association.

The third form of parallelism toward which atten-

tion may be drawn in showing how mental development might have been aided is that well-known one between the increasing complexity of the nervous system and the growth of intelligence. Starting with the simplest form of nervous system found in microörganisms, one could readily select types and arrange them in a gradually ascending scale until one reached the complicated system of man. In doing so, it would be found in general that the degree of intelligence which the animal possessed corresponded very closely with the complexity of the nervous system.

Not knowing definitely the relation between brain and mind, it is impossible for us to form a definite argument on this relationship, but at least the facts are very suggestive. If we find that intelligence develops with the weight and size of the brain, with the development of certain parts of the brain, and with the complexity of the nervous system (and we can find graduated scales of each with man closely related but superior in each particular) it does suggest the development of the brain and the parallel development of the mind of man from some lower type.

B. Recapitulation.

The evidences of recapitulation have been destined to be one of the chief props of the evolutionary theory. It is a parallelism, but a parallelism so ar-

resting and so closely applied that it is difficult to find any other explanation of it than that of evolution. While the actual evidence is naturally only available to biologists and embryologists, their accounts are most interesting and convincing.

The facts which form the parallelism are these: In the nine months of prenatal life, each human individual passes through various stages, so that at appropriate times the embryo is very like the embryo of the various species through which he is supposed to have evolved. Early there is the simple division of cells like that of the lowest forms of animal life, then through various invertebrate states. Following this, it becomes like the embryo of vertebrates in their various developments, the fish, reptile, birds, and mammals; and finally the embryo becomes characteristically human. Thousands of years of animal history must be passed through in as many minutes or seconds, but the main divisions of animal life are recognizable at different stages. The course of evolution is as plainly traced in this way, as it is through the different layers of rocks by the geologists.

At the time of birth, however, the fully developed human being does not appear; but years of development after birth are required to furnish man in his final stage. There is a definite relationship between the length of the period of infancy and the height of development. The lower forms of animal life at birth,

or at the end of incubation, are perfectly able to care for themselves; while the helplessness of the human infant is proverbial, and it requires one or probably two decades for the fully developed human being to mature. The question naturally arises whether or not the period from birth to manhood does not also follow a line of development, and the theory finally has been formulated that, while the prenatal life recapitulates the history of the race up to the time that human beings appeared, the development from birth to adolescence follows the course of human history to the present time.

When this theory was propounded and developed two reactions naturally took place, one unfavorable and the other favorable. There were many who objected to it, not only on account of its being a general part of the theory of evolution, but some evolutionists thought of it as not according with the facts, or at least as not sufficiently close to the facts to warrant the theory. The chief objection to the theory is that while in many respects the order of development of the child and the race accord, there are some serious discords. For example, the sexual instinct, which must from necessity have appeared early in the history of animal life, is one of the latest to appear in the history of the human individual. There are similar discrepancies in physiological recapitulation, but study has shown reasons for the change.

Further study will undoubtedly show corresponding reasons for the psychological changes.

Concerning this objection there are two things to be said: first, the contention is that the time from birth to adolescence does not recapitulate the history of animal development from the beginning, but only that of the human race; and we know that in pre-human animals, especially the higher mammals, the sexual instinct develops late. It is to be noted, also, that a multitude of lower forms of life are devoid of sex; reproduction was necessarily from the beginning, but sex did not appear until later. Freud insists that sex appears very early as a psychological phenomenon, but the lateness is in its physiological maturity. If this is true, the discrepancy can be left to the physiologists to explain. In the second place, it has never been contended that this evolution of the human race, or any other form of evolution for that matter, took place without modifications from various directions. We recognize, in fact, that these modifications are the chief contributing cause to evolution. In any case, for the sexual instinct to develop and function before the animal was ready to care properly for the offspring would cause the extinction of that species; so that natural selection would provide for the delay of the maturity of sex until the appropriate time, which in man would be late. The statement of the theory should include these exceptions, and

should read that the development of the individual human being recapitulates the development of the race, except in so far as modifications have taken place according to the demands for perpetuating or improving the race. The most that can be said for the theory is that *in general* the development of the race and of the individual coincides, but only that much can be definitely affirmed. The chief interest in this theory for us in our present study is that this branch of evolution follows the psychological rather than the physical development of man.

Among the first to approve of this theory and to make a practical application of it were the educationalists, and it was not long before they formulated certain "cultural epochs" which typified certain stages of development in the race. For example, there were the hunting stage, the collecting stage, and various other stages through which the race had successively passed; and upon this there was built up an educational theory that the individual must be allowed to participate in the activities of a certain stage in which his ancestors indulged, in order to be well fitted to enter the following stage and carry on its activities. When these stages were appropriately passed through, he would be in a better position to take up the final stage of mental development and education which civilization imposes upon the modern man. How strictly such a regimen should be fol-

lowed, if the theory is true, is doubtful; but there seems to be some substantiation for the general idea from the proverbial success of men whose early years have been spent in physical activity, which the farm life of fifty years ago demanded of the children of the family.

Up to the present time the effort has been made to prove that the history of the race is recapitulated in the individual. If this is established in a general way, can we not turn the investigation around and show that the individual recapitulates the history of the race? We could then have additional proof of the evolution theory, especially that of mental evolution, and obtain information concerning the course along which the race has developed. We have these various steps, not as valuable factors in modern life, but as vestigial factors in the mental life, showing the way in which man has travelled, and on account of nature's conservatism still being retained. There have been nearly two hundred vestigial and regressive bodily organs traced to man;—may there not be far more mental factors of the same nature, of which these stages of recapitulation in the development of the child are impressive ones?

We find that the objectors to the evolutionary theory take the same ground when dealing with mental as with bodily development. That man develops individually from a single cell cannot be controverted—

and is generally admitted. There is, however, a very decided but inconsistent objection to admitting that the race developed in the same way. That man develops from very, very low intelligence at birth to a high mental plane at maturity is as generally accepted; but there is objection to the theory that the race has developed in the same way. There seems to be as little valid objection to the theory of the development of the race as to that of the individual, or to mental as to physical development.

CHAPTER IV

WHAT DO INSTINCTS TELL US ABOUT THE PAST?

WE look to the instincts for our most direct evidence of human mental evolution, for through and in them we see our closest connection with the mental life of animals, and in them we see survivals of animal traits, some of which are no longer valuable to us and others of which may even be a disadvantage. These are mental vermiform appendices. The emotion of fear which accompanies the instinct of flight is seen in connection with certain experiences. There is an instinctive fear of loud noises. Many people are afraid of thunder, notwithstanding the fact that they know it is the lightning which causes the damage, and that when the thunder is heard the danger is over. One is at a disadvantage who is afraid of thunder, but it is difficult for many to overcome the fear, and impossible for some. There is also instinctive fear at the loss of bodily support. The emotion of anger appears instinctively, when bodily movements are restrained or restricted. The instinct of flight, with accompanying fear, is experienced when a dog barks at our heels. It is futile to run; for the dog can run faster, and our running would probably encourage him to pursue and perhaps to bite us; but we in-

stinctively start to run under such circumstances. These and other examples show the mental vestigial traits which we cannot yet abandon and for which we are indebted to our prehuman ancestors. Some of them have long ago outgrown their usefulness, but nature's conservatism passes them on to us.

There has long been controversy and discussion concerning the relation between reason and instinct. Years ago it was affirmed that men were ruled by reason and animals by instinct, but this affirmation has long since been silenced; for we know that even those animals which seem most guided by instinct are not devoid of reason. It is true that some animals, as, for example, the insects, seem to be impelled and directed entirely by instinct. Notwithstanding this, when prevented from accomplishing the result which instinct impels, by means of the methods which instinct usually employs, they have been found to show apparently rudimentary intellectual ability, sometimes of a high order, in a degree usually attributed to human beings only. For instance, we have a well-attested example of a wasp picking up a pebble in her mandibles and using it to pound down the loose dirt placed in a hole. She brought more loose dirt, and again seized the stone and used it as before. Man is sometimes called "a tool-using" animal, but he must share this distinction with lower forms of life.

On the other hand, we are equally certain that man

is not guided by intelligence entirely, and some would say not principally. The instinctive life of man has received considerable recent attention, and this study has resulted in much profitable knowledge. It is evident that we are far from the end of such an investigation, but enough has been done to show the large part which the instincts play in human mental life. Little, if any, of our impelling mental force is compulsory power of the intelligence; it is furnished by the instincts. Intelligence, however, adds much to our ability to accomplish the feats which the instincts demand. While instincts were formerly considered lower than intelligence and not worthy of an intelligent, moral, and religious being such as man, we now know that every characteristic act of the most exalted saint as well as of the lowliest sinner has its genesis in the instincts. In fact, we have come to the place where we recognize that if man is to be understood we must examine his ancestral traits. The fact that he is controlled by both instincts and intelligence is one of the reasons why he is man.

Elliott Smith calls attention to the value of an even or gradual development which does not sacrifice the possibilities of future achievement by narrow specialization. For this reason it is not unlikely that the ancestors of man played a much more humble rôle than some of their cousins who attained immediate success on account of early specialization. The result

of this early specialization was the sacrifice of primitive simplicity and plasticity of structure, which tended to prevent adaptability to new conditions. Our simian cousins undoubtedly attained an immediate advantage by specializing in hands. The development of the hand, where one digit (the thumb) is opposed to the others, giving a grasping power unknown before, was one of the greatest advances ever made in nature. Monkeys and apes developed four of them, one on each limb. By this means they would naturally have an advantage over man's ancestors, especially in an arboreal life.

Prehuman stock, in escaping this specialization, sacrificed immediate advantage for future gain; and, being content with two hands, developed eventually two feet: being the only animal which has the inside digit on any limb the longest, and consequently being the only one which can walk erectly with comfort and efficiency. Similarly, the time was when insects specialized in instincts. We can understand what an initial advantage this would be; but man's remote ancestor, developing more evenly, if less brilliantly, did not specialize so much in instincts, and consequently had to call more frequently on his intelligence. Through the necessary use of intellectual factors, the development came which made him depend less on instinctive behavior for means of satisfying the im-

pulses, and consequently to become primarily the intellectual animal.

Instincts are so well adapted to the purposes they serve, that it is difficult to conceive of their being the result of a "trial and error" method of development, or of chance development. It almost appears as if they could be the result of only the highest intelligence, coupled at times with omniscience. The explanation which comes first to us is that intelligence must have had something to do with planning the acts which later became instinctive, and some theories of instinct have been formed to conform to this idea. The theory of Lamarck, that instinct is inherited habit, if it did not conflict with the difficulty of postulating the possibility of inheriting acquired characteristics, would assume the presence of intelligence in the formation of habits. Lewes goes further and defines instinct as "lapsed intelligence."

There are two difficulties attending any theories of this kind. The first is that so far as we know, both in the individual and in the race, instinct precedes intelligence—at least, so far as any apparent development is concerned. The second difficulty, especially in Lewes's theory of lapsed intelligence, is that if this theory were correct, we should expect to find intelligence highest and instinct correspondingly absent in the lower animals, and the higher animals to have most perfect instincts with intelligence factors less

prominent. The exact reverse is the case. Biology and psychology have never pointed out a single case where intelligence has lapsed into instinct, but there are many cases where the urge of instinct seems to have been instrumental in the development of intelligence.

We must be careful, however, not to fall into an alternate error, and think of intelligence as being entirely absent until instinct had become perfect, and then growing out of the latter as the perfect fruit of a productive plant. It seems rather that intelligence developed early, if then imperfectly; and that it was concomitant with instinct in its development, but slower in attaining perfection. Instinct did undoubtedly develop first, but that does not mean that intelligence was entirely absent until instinct was complete.

There are some instinctive acts performed by wasps and moths which betray such wonderful foresight that it seems absolutely impossible, at first, to explain them without intelligence of the highest order. Some seem to be so far-sighted that even intelligence does not appear equal to the task of initiating them. Take the case of the Yucca moth. The flower in which the eggs are deposited opens for but a single night. The moth emerges from her chrysalid case just as the flower opens. From the anther of one of these flowers the moth collects the golden pollen,

and deposits it with her eggs among the ovules of the pistil of another flower. The fertilization and consequent development of the flower are necessary for the sake of her offspring. "These marvellously adaptive instinctive activities of the Yucca moth are performed but once in her life, and that without instruction, with no opportunities of learning by imitation, and, apparently, without prevision of what will be the outcome of her behavior; for she has no experience of the subsequent fate of the eggs she lays, and cannot be credited with any knowledge of the effect of the pollen upon the ovules." Could highest intelligence adapt means to ends any better?

While it is unlikely that intelligence had any extensive rôle in the forming of those acts which subsequently become instinctive, it evidently has had more part in determining which instinctive acts should survive. Though acquired characteristics may not be transmissible, we know that unused organs and activities are eventually lost. Not only do different instincts vary in impulse and perfection of execution in the same individual, but the same instinct varies in these respects in different individuals. In general, however, the instincts and intelligence of the individuals of any one species are so much alike that they are used together in much the same way, and only those instincts are perpetuated in any species which the intelligence uses. Intelligence

makes the instinctive acts of the individual more worth while; the higher the intelligence of an animal the more varieties of use an instinctive impulse may have, and the greater the use for the good of the individual. This selective use of instincts by intelligence serves us in the way of direction, and becomes one factor in mental evolution. It is to be noted, however, that there is probably no place where natural selection has so nearly the appearance of inherited habit as in the realm of instinct. In their completed forms, habits and instinct are so much alike in operation that if we did not know their history it would be difficult to differentiate them. Both use reflex action and combine a number of reflexes in their processes, but it is the adaptive combination in each case which is the distinctive part. The emotion which invariably accompanies the instinct is less definite and intense, if it is at all present in habit.

Tracing the different theories of the genesis of instinct, we find Spencer deriving instinct from reflex action and the inheritance of reflex associations which have been acquired. In his time the transmission of acquired characteristics was not discredited as it is today. Wundt followed Lamarck and attributed instinct to inherited habit. Eimer also followed Lamarck, and did not hesitate to presume that the habits which later became instincts were the result of intelligence of a high order. Romanes regarded

natural selection and inherited use as the most important factors, but the examples which he gives to prove the latter seem to be of doubtful value.

If we are debarred from using the theory of the transmission of acquired characteristics in our explanation of evolution, as we apparently are in the present development of science, we are forced to fall back principally upon the theory of the natural selection of variations or mutations. Some other factors evidently enter in, such as intellectual selection, just referred to; but these subsidiary factors are only aids to, or variations of, natural selection. Instinct, which at one time promised to swing us away from natural selection, is now also constrained, as much as any factor, to fall back upon it for explanation.

If the structure of the body as a whole, or of any portion of the body, can be brought about through natural selection and passed on by heredity, it seems very natural that the functions and use of the body or organ should be developed and transmitted in the same way, for there is a very definite correlation between the two. Wings and flying, egg-laying and nest-building, bills and food-getting are in each case closely related and have evidently had a reciprocal action. They are complementary, and the particular form of one in any species may be explained by the particular form of its complement. Not until we have progressed much further in the investigation of in-

stincts, and see the relation of these complementary factors through the nervous system, can we fully describe, to say nothing of explain, this relationship. There seems to be, however, no reason why we cannot recognize it.

Our ideas concerning instinct have changed considerably with the extension of investigations of it. This change may be indicated by noting that Hobhouse says there is "abundant evidence showing that instinct is not always perfect in its working; that it does not proceed on an unchangeable model; that it is on occasion applied mistakenly, uselessly and injuriously; that it is often incomplete at birth, and requires development; and that at any rate, among the higher animals, it is so interwoven with intelligence that the two factors become exceedingly difficult to disentangle." These statements, which modern investigators seem to confirm, make of instinct a very different factor from what it was supposed to be prior to fifty years ago.

The amount of painstaking and minute investigation which has been made during this time has been prodigious, and gives data from which to draw general laws and to form theories, and yet much detailed investigation remains to be made. Coupled with this minute and patient observation on the part of scientists there has also been an immense amount of writing on the subject, biologists and psychologists vying

with each other in this respect. Hardly a book on either subject has been written (and there have been many) without some reference to this fertile field of investigation and speculation. It is, therefore, very difficult to sum up in any adequate way the results of all this work, but perhaps we could do no better than to follow one writer, who, while using as a basis the results of recent investigations, has emphasized one factor and differentiated the main elements.

McDougall has defined instinct as "an inherited and innate psycho-physical disposition which determines its possessor to perceive, and to pay attention to, objects of a certain class, to experience an emotional excitement of a particular quality upon perceiving such an object, and to act in regard to it in a particular manner, or, at least, to experience an impulse to such action." In this definition the author has not only laid emphasis upon the action, or the impulse to action, which is usually the core of all definitions of instinct and the part of the instinct usually described; but he notes the knowledge which the instinct entails, and, especially, the emotion which is the unfailing accompaniment of, or part of, every instinct. Habitual acts may be performed unconsciously, and be absolutely neutral as far as feeling is concerned, but instinctive acts are never thus, although some former writers used to speak of human instincts as being unconscious.

The receptive and motor parts of an instinct may be greatly modified by training, by the application of intellectual factors to experience, and by other means; but the emotional factor persists through all these experiences practically unchanged. It is this discovery, and the differentiation and distinction of the emotional element which have been McDougall's most noteworthy additions to the subject. He has given us a statement of the emotion which forms a part of or accompanies each instinct, and instead of naming the instinct indiscriminately after the action or the emotion, has started the custom of naming the instinct invariably according to the resultant action, which ought to aid somewhat in clarifying the situation. For example, instead of speaking of the instinct of fear, he designates the instinct as "flight" or "escape," recognizing fear as the accompanying emotion.

It might be thought that with the general understanding among educated persons concerning the nature of instinct, and especially the agreement among scientists, it would be a comparatively easy task to agree upon a list of instincts. This is far from the case, for not only does every writer have a different list, but a single writer will vary his list at different times. McDougall's first list, with the accompanying emotions, was as follows:

Flight—Fear
Repulsion—Disgust
Curiosity—Wonder
Pugnacity—Anger
Self-abasement—Negative self-feeling
Self-assertion—Positive self-feeling
Parental—Tender emotion

To these seven he added five others with less well-defined emotional tendencies, namely, Reproduction, Food-getting, Gregariousness, Acquisition, and Construction. He recognized also minor instincts such as crawling and walking, and pseudo-instincts—suggestion, imitation, and sympathy.

A subsequent list of the same author contains fourteen instincts, as follows: Parental, Combat, Curiosity, Food-seeking, Repulsion, Escape, Gregariousness, Passive Sympathy, Self-assertion, Submission, Mating, Acquisition, Construction, Appeal. It should be noted that the latter list contains all of the first two classes of the former list, although some of them under different names. These lists have been quoted, not only to give some idea of the latest conception concerning the content and extent of instinctive human action, but more especially to show how difficult it is for one person to decide upon what should be included under the classification of instincts, and thus

to indicate the differences of opinion among the many scientists working on this subject.

Taking the latter list as the result of the more mature thought of the author, we see that there is not one of these human instincts which man does not share with the lower animals. Examining them one by one, there immediately come to mind numerous examples of each instinct in the complete range of the animal kingdom; and in the cruder, more primitive expression of them we find a very close kinship. This is undoubtedly where man shows his relationship to his humbler cousins most clearly, and the strength of impulse is no less apparent in one than in the other. Those who classify all instincts under the three heads of self-preservation, nutrition, and reproduction find the relationship equally true; and those who, on the other hand, multiply the number many fold are just as conscious of the connection. As bone for bone we resemble other vertebrates, and organ for organ far older genera, so instinct for instinct we parallel them.

If, however, the similarity of instincts shows our relationship to the lower animals, the total expression, due to the higher development of some of them and the modification caused by intelligent adaptation, as clearly shows our differentiation from them. It is true that unless one knows the history of the development of some of the instincts, one would scarcely recognize some of the expressions as belong-

ing to the instinct. For example, the choice of a necktie by an adolescent young man seems to have little relationship to the sexual instinct, or the praiseworthy, altruistic choices of modern philanthropy to the parental instinct, but both can easily be traced back not to trained judgment but to the respective instincts. The instinctive impulses betray the fact that we are animal, the form of their expression reveals that we are human.

CHAPTER V

HAS HUMAN INTELLIGENCE SUPERSEDED INSTINCT?

WE have already noted that as far as development is concerned instinct was prior to intelligence, ripening first, and showing its capacity to adapt the organism to the needs of the environment while intelligence had made little progress; that the function of intelligence is to fulfil in a more adequate way the instinctive impulses, intelligence thus becoming the servant of instinct; and that we always find instinct and intelligence in intimate coöperation, and usually so intertwined as to make it most difficult to resolve them into their separate elements. With this as a basis, we may proceed to the development of these points and to a further examination of the relation between these two mental factors.

The fact that man has more prominent and serviceable intelligence does not mean that he has weaker instincts. In former days it was asserted that animals were controlled by instinct, but man by reason. We may account for this mistaken notion by the fact that animals respond to instinctive impulses in a direct, simple, and undeviating manner; while man with his superior intelligence is able to respond in a variety of ways, some of which are so indirect and complicated

as to mislead people concerning their origin. Not only may the responses be indirect and complicated, but according to some recent investigators they may be symbolic as well, so that the impulse to action may be completely hidden, or the expression may seem to deny the very instinct which impelled it. The celibates of the Middle Ages proved the strong impulse of the sexual instinct which their mode of life seemed to deny. The very denial, which was deemed so necessary, was evidence of its strength; and their ordinary as well as their abnormal experiences would reveal to anyone familiar with the modern psychological point of view the large part the sexual instinct played in their lives. Sublimations of one kind or another were common, and the erotic expression of their love for celestial or divine beings was hardly sufficiently disguised to be called a sublimation. It was because man did not respond to instinctive impulses in the crass, narrow, direct way characteristic of animals that he was supposed to have left instinct behind and to have substituted intellect in its place. Because intellect guided the fulfilment of the impulse, it was given credit for originating the impulse, —the steering wheel was thought to be the engine.

One rule which seems to apply generally is that the more highly specialized an instinct is the less the intelligence seems to enter into it. This is reasonable, for if an instinct is so specialized as to deal with a

detailed rather than with a general result, there would be fewer ways of responding, and consequently less opportunity for the display of intelligence. It may be said in a general way, that the lower in the scale of animal life the more specialized are the instincts. This may account for the rise of intelligence as life advanced, for with the more general impulse of instincts, the greater opportunity for the use of intellectual factors would aid in their development, regardless of the way in which they did develop. In man we see the instinctive impulse least specific; not weaker, however, on that account; and this may be an additional reason why the power of instinct in the human life was not so easily recognized in former years.

One further reason why the power of instinctive life was formerly not so clearly recognized in the human animal was that there are very few human instincts which appear immediately after birth, most of them ripening much later. We marvel at the young chick, which begins to peck at small objects soon after it is out of the shell, out of which it has had to hammer its way, and recognizes the call of the mother hen, following her from place to place. Or if we look still lower in the scale of life, we find other forms which are as fit to battle with enemies or to procure food on incubation as at any time of life, and are already provided with instincts which enable them

to perform all necessary activities, and to perform them effectively. The gradual nature of the appearance of human instincts contrasted with the ready-made appearance of those of the lower animals, has served to make the former less striking and consequently less noticeable.

It is while the instincts are maturing that the young of the human species develop skill and acquire knowledge—in other words, receive their education. While this is of immense advantage to the individual and to the race, it serves also to hide the development of the instincts and to assign to other means the part which the instincts play in human life. We give to schools, to teachers, and to books the credit for initiating certain actions which in truth are the result of instinctive impulses, and which simply owe the details of their execution to the educational forces. Or, on the other hand, we blame certain agencies for conduct of which we do not approve, when the real springs of action may be instinctive. In both cases we credit to the intelligence what is really the result of instinctive impulse. We must not in any way underestimate the value of the long infancy of the human infant; but, on the other hand, we can recognize the manner in which the training may hide the true source of the impulses.

In the discussion of instinct and intelligence they are usually opposed and contrasted, but in reality

they are supplementary and complementary. They are different ways which nature has for accomplishing her purposes, not contradictory ways. By instinct she is assured of immediate success of a particular, somewhat limited end by direct method; but she is, by this means, circumscribed and unable to take a long step in advance—it is a sure, but short step. By intelligence she takes greater risks, but if successful there seem to be no limits to her progress. It is a hazardous, though perhaps a long step. When instinct completes an action, it is finished and definitely closed; it aims at a certain mark and hits it. The incident has no sequel which is directly related to it. With the intellect the case is very different. Every need which the intellect satisfies is the foundation for a new need, and thereby an endless chain of progress is begun. Every intellectual act is an experiment in adventure; one never knows where it is going to end.

All this presupposes that instinct and intelligence are found in a pure state, and that we can note the effect of their unmixed action. To the contrary they are never so found, and we have no examples of them in this form. In imagination we may conceive of instinct without any intellectual factor, and try to picture the action of such an experience; practically, however, we cannot know it. In the instincts connected with the lower forms of animal life we get the

least intelligence, but even here there is possibility, at least, of some intellectual activity. The difficulty here is that there is the probability of another confusion at the opposite pole; namely, the danger of being unable to differentiate instinct from reflex action.

The winking of the eye, when foreign matter enters it, is a good example of a reflex action, for it takes place immediately after the external stimulation, with or without consciousness, and over which consciousness has no control. The knee jerk, when the foot is involuntarily thrown up after a blow below the knee-cap, is another example which shows that only the nervous elements of the spinal cord are directly involved. On the other hand, instincts, in human beings, always involve consciousness, depend upon the operation of the higher or brain centers, and are much more complex. Instincts consist not only of a single movement, but of many movements, each one in itself perhaps useless, but when combined serving a valuable purpose; the nest-building of birds, for example. When, finally, we have methods used which are the result of something in addition to reflex or instinctive action, we must impute intelligence.

We usually think of instinct as action based upon hereditary modes of response, and this is invariably true. We further consider that an instinct has one

unfailing mode of response, and if another appears it is due to the work of intelligence. This, however, is difficult to affirm. Theoretically and ideally we can easily differentiate the two, but practically it is not so easy. Some instincts, and especially is this true of the higher or more complex and less specific ones, seem to have alternative methods of response; and if one, which is always first choice, is not successful, the other one is used. We may, perhaps, use this method of differentiation between alternative instinctive responses and intelligent responses; namely, when the second method of response is invariably used, we may think of that as alternative instinctive; but when different responses are made by different members of the same species, or by the same member at different times, after the blocking of the usual instinctive response, then the response is intelligent. These alternative methods of response are usually found in the more complex instincts, but so also are the intelligent factors. This makes the differentiation correspondingly difficult.

As an example of the alternative method, which is unvarying in the species and seems to be due to heredity, a quotation from Preyer may suffice. "Very young hermit-crabs, not long after leaving the egg, rush with extraordinary animation for suitable shells that are given to them in the water. They examine the opening at the mouth, and take up their quarters

inside with remarkable alacrity. But, if it chances that the shells are still occupied by molluscs, then they stay close by the opening, and wait until the snail dies, which generally occurs soon after the beginning of the imprisonment and the strict watch. Upon this the small crab pulls out the carcass, devours it, and moves into the lodgings himself."

Instincts which have alternative methods of response are rare, and are not characteristic; for usually an instinct has a course of action of some length, fixed, and with no alternative. Intelligence, on the other hand, has no fixed course of action, but recognizing the ultimate aim, is indifferent to means, so long as they accomplish the desired end. In the lower forms of intelligence, not the whole plan or ultimate aim which the instinctive impulse implies, but only an intermediary end may be grasped, and means adopted to accomplish that; the more developed the intelligence is, the more surely the ultimate end is perceived, and to accomplish this short cuts may be taken. Unmodified instinct, however, takes no short cuts, but traverses every stage with unfailing regularity. In human beings, the most important part of the instinct is the impulse. Whether this is carried out by the instinctive or the intelligent method is of less moment, although the human ideal is to have an instinctive impulse perfected by intelligent means. That a man marries is the result of an

instinct; that he marries only one woman is the result of intelligence.

We have already referred to insects as furnishing the best example of animal life controlled by instinct, but even here we see many acts performed which have every appearance of intelligent variations, for these variations are not constant, and depend upon the circumstances of the moment. It is a general rule that the amount of intelligence manifested by any insects depends upon the complexity and perfection of their instincts and upon the development of the nervous system and the sense organs. Groups of primitive insects manifest very slight intelligence, but the Hymenoptera, whose instincts have attracted widespread interest and astonishment, show most intelligent action.

We have no more accurate or valuable investigations of insects than those made by the Peckhams. These studies show that the homing of wasps occurs in the same way as that of carrier pigeons, and, in fact, of human beings under like circumstances. The wasps, before departing from the nest for the first time, make elaborate "locality studies," flying around the nest in wider and wider circles and going higher and higher in the air. A human being, placed in unfamiliar woods, would naturally make "locality studies" before going far from camp. He would observe certain landmarks and make others, so that

he could the more easily notice them and trace his way back. This would be especially true if he were not following a single trail, but were likely to be called in any direction by the game which he sought.

Of an Ammophila, a solitary wasp, which has been seeking a place in which to dig a nest, the Peckhams say: "At last a spot is selected and she begins to dig, but two or three times before the work is completed she goes away for a short flight. When it is done, and covered over, she flies away, but returns again and again within the next few hours to look at the spot and, perhaps, to make some little alteration in her arrangements. From this time on, until the caterpillars are stored and the egg laid, she visits her nest several times a day, so that she becomes perfectly familiar with the neighborhood, and it is not surprising, after all, that she is able to carry her prey from any point in her territory in a nearly direct line to her hole—we say nearly direct, for there was almost invariably some slight mistake in the direction which made a little looking about necessary before the exact spot was found.

"After days passed in flying about the garden—going up Bean Street and down Onion Avenue, time and time again—one would think that any formal study of the precise locality of a nest might be omitted, but it was not so with our wasps. They made repeated and detailed studies of the surroundings of

their nests. Moreover, when their prey was laid down for a moment on the way home, they felt the necessity of noting the place carefully before leaving it.

"Aporus faciatus entirely lost her way when we broke off the leaf that covered her nest, but found it, without trouble, when the missing object was replaced. All the species of Cerceris were extremely annoyed if we placed any new object near their nesting place. Our Ammophila refused to make use of her burrow after we had drawn some deep lines in the dust before it. The same annoyance is exhibited when there is any change made near the spot upon which the prey of the wasp, whatever it may be, is deposited temporarily."

In a previous chapter we have laid down a test of the differentiation of intelligence from lower forms of mental life. This test was the ability to form associations. Later we have expressed the same thing in other words when we have given as another test the ability to learn through experience. Holmes unites these two tests in summing up his conclusions concerning the wasps, and I can do no better than to quote him. He says: "We are certainly justified in concluding that insects are not mere reflex machines incapable of learning by experience. They can form associations very quickly in many cases. They give evidence of memory. They have a remarkable ability for retaining impressions of topographical relations.

We may not be compelled to admit that they have ideas, but it must be granted, I think, that a wasp which after cutting a caterpillar in two and carrying away one part, came back and searched diligently for the remainder, retained somehow an impression of the missing part and its location. If out of sight it was not out of mind.

"As the wasp when it has disposed of the second moiety of caterpillar no longer returns, its mental content is evidently changed by having carried the part to its nest. If there is something representing 'part-of-caterpillar-among-leaves' that leads the wasp on its hunt, we may conclude that there is also something corresponding to 'part-of-caterpillar-now-in-nest' which prevents further search."

There seems to be little doubt but that insects do fulfil the requirements of the tests and show some intelligence, but this exhibition of intelligence is practically always in connection with some instinctive tendencies. Outside of these they are exceedingly stupid. The foundation of all associations in insects, as well as in other animals, is not so much association of experiences, as the association of experiences with the instinctive impulse. What is true of association is equally true of imitation in all lower animals; namely, that animal imitation is almost invariably in connection with their own instinctive movements. Numerous experiments have been made with ants

and bees, which frequently perform acts of such undoubted intelligence, revealing their inability to make even the simplest inferences in connection with matters which are not immediately related to their instincts. After witnessing some actions which stir one's enthusiasm and cause one to consider some insects to be very intelligent, one's faith is shattered the following moment by the utter lack of intelligence when it might be expected to manifest itself. At most, a bee's intelligence is of a very low order, but we can assert that it is undoubtedly present at times.

If it is true that intelligence is always displayed along instinctive lines, we should expect to find what in reality we do find,—that the intelligence of animals differs with their instinctive actions. On this account ant intelligence is different from crawfish intelligence, and cat intelligence is not the same as human intelligence in its application. However, they all agree sufficiently to come within the definition already laid down. The gradual change in instincts, as the different species changed, would be followed by the gradual change in the application of intelligence. But intelligence in individual human beings differs; one has a genius for mathematics, while another may be absolutely unable to appreciate mathematical problems. The latter may be able to learn languages readily, which the former finds most difficult. Simi-

larly, it is in the application of intelligence that animals differ.

Before we leave the discussion of instinct and intelligence in connection with insects, we may well refer to the reputed communication between ants, and to a lesser extent among other insects. That there is some communication is undoubtedly true, but the method of it is somewhat uncertain, notwithstanding the investigations which have been made on this subject. At one time it was thought that certain sounds were made and recognized as in higher animals. Now almost all that is predicated of them is a sign language, which operates through the cutaneous senses, rather than by sight or hearing; although all authorities do not agree on this. Striking with the antennae in different ways and upon different parts of the body of the recipient seems to be the chief means of imparting information or of calling for aid. While one ant can communicate with others about food and danger, and can lead these others to a feast or a fray, it is unable to tell them where the food or danger is. Among bees, notes of anger, or of danger, or even of distress, or of swarming are recognized, but the communications seem to be much fewer in number than among ants.

In our discussion of instinct and intelligence we have used as examples the insects in which instinct is supposed to be the most highly developed, and in

which intelligence is considered nearly absent. We have found undoubted examples of intelligence even among insects. As we progress higher, among the vertebrates and especially among the mammals, we find still more frequent and more sure signs of intelligence, until in monkeys and apes, the mammals most closely related to man, we find intelligence at its highest development among animals outside of the human species. As we find intelligence increasing we do not find instinct decreasing, but furnishing the impulse to action as surely in the higher animals as in the lower.

The permanency of instincts is one of their chief characteristics. They are inherited elements and no training has been able to eradicate them, although it may change their manner of expression. Training is equally unavailing in the endeavor on the part of individuals to acquire them. They are constant factors upon which we can always depend. Trotter has made a strong case for the thesis that human society has never been directed by intelligence but always impelled by instinct. Nothing has been more interesting and instructive in recent years than his wonderful diagnosis of conditions based on his interpretation of the different reactions of England and Germany to the herd instinct, and his prophecy of the course of the war, which was a legitimate conclusion of his interpretation. His words written in 1915 in

anticipation and prophecy were as accurate as those written by others in 1919 as history. They were almost uncanny, but after all nothing more than scientific deduction from observed facts, just as science can predict that water will decrease or expand in different temperatures.

The science of politics and government should be recognized as a branch of psychology, and prophets should arise and tell us in advance the results of other reactions to the same or different instincts under other circumstances. We realize that seldom will conditions be so concentrated, and consequently so favorable for prediction, as they were in 1915, when the world was intent on one object; but it simply means that our diagnosis will have to be more careful and our prediction genuinely scientific. If it is true, as Trotter contends, that society has not yet been directed by intelligence, then there is the possibility that such direction may be injected which would correspondingly complicate the prediction. He sees in intelligence a new and unique factor. Instinct with its derivatives, he thinks, falls into line with the natural order and is no new departure, but intellect brings with it a new factor. When instinct and former natural elements furnish desire, intelligence provides purpose, and purpose is a new and pregnant force. Where this will lead us is difficult to predict, but the intelligence is not lawless, and if it does make

itself felt we should, after study, be able to prophesy what the result of instinctive impulse and intelligent purpose will be, and so guide the world toward a desired goal.

CHAPTER VI

IS MORALITY CONNECTED WITH ANIMAL IMPULSES?

IN calling attention to mental differences, and especially to the feeling on the part of many that the mental life of man is unique in character and calls for an origin different from other elements in his nature, we had occasion to touch on moral and religious experiences. It was pointed out that so important an element as morality should on the creative basis be the most stable; but on the evolutionary hypothesis its very instability, pointing to its late appearance, is a proof of its importance, if there is any design in nature. It was further indicated that origin is no test of value, and that if it should be proved that our moral and religious life could trace its ancestry back to animal elements, that fact should in no way lower its value in the estimation of anyone who takes the trouble to investigate origins; for all origins are most humble, both individually and racially. Starting with these statements, we may continue to examine further what we recognize as the highest development of the mental life of man.

In a recent verse, "To an Unknown Ancestor," Mr. S. Omar Barker allows some credit to revert to ancestry, in the following expression of gratitude:

My gifts have come to me far down the years:
I am the son of huntsmen of old time,
The heir of timid virtue and of crime,
Offspring of sluggards and of pioneers,
Inheritor of juggled hopes and fears.
Some gave me purity, some gave me grime
Of damaged souls. Some of them helped me climb
Toward God. From some came smiles, from others tears.

Oh, I am cluttered up with legacies
Long lives of jumbled blood have handed down,
Yet I thank God upon my bended knees
For him who, whether king or bawdy clown,
By making sympathy his conscious art,
Bequeathed the gift of kindness to my heart.

Very good! But to whom was his ancestor indebted, and his ancestor's ancestor? Langdon Smith in his famous poem, "Evolution," goes back a little nearer to the source. Space permits the quotation of only two stanzas:

Our trail is on the Kimmeridge clay,
  And the scarp of the Purbeck flags,
We have left our bones in the Bagshot stones,
  And deep in the Coraline crags;
Our love is old, our lives are old,
  And death shall come amain;
Should it come today, what man can say
  We shall not live again?

God wrought our souls from the Tremadoc beds
  And furnished them wings to fly;

He sowed our spawn in the world's dim dawn,
And I know that it shall not die;
Though cities have sprung above the graves
Where the crook-boned men made war,
And the ox-wain creaks o'er the buried caves
Where the mummied mammoths are.

Darwin made an interesting statement bearing on this subject. He said, "The following proposition seems to be in a high degree probable; namely, that any animal whatever, endowed with well-marked social instincts, would inevitably acquire a moral sense or conscience as soon as the intellectual powers had become as well developed, or nearly as well developed, as in man." His disciple, Romanes, put the matter in a negative form when he said: "It is certain that neither of these qualities [religion and morality] could have occurred in that species [the human], had it not also been gifted with a greatly superior order of intelligence. For even the most elementary forms of religion and morality depend upon ideas of a much more abstract, or intellectual, nature than are to be met with in any brute." While some people draw the distinguishing line between animals and men so as to separate the intellectual and moral elements, most people who do not accept the moral nature of man as a product of evolution deny also that the intellectual nature is to be accounted for in this way. The break,

if there is any, should logically be placed between the physical and intellectual rather than between the intellectual and the moral qualities. Such staunch believers and exponents of organic evolution as Wallace and Huxley did not believe that moral faculties, and especially moral practices, were derived from the lower animals. This much may be affirmed: we must have sufficient intellectual ability to distinguish values, present and future, before we can have a very high degree of morality. In laying a foundation of intellectual relationship with animals, we are, at least, making a moral relationship possible.

The examination of our problem may be conducted in two different ways, according to the end at which we begin. We may examine the animal mentality to see if we can discover any factors which might develop into morals as we recognize them in human beings; or we may examine the moral nature and practices of man to see if we can discover any factors which bear any resemblance to the nature and practices of animals. Perhaps we can do no better than to combine these two, for they are complementary, not exclusive. We have already noted that the instincts are as strong in man as they are in animals, and show a very clear relationship both in quantity and quality. It is altogether likely that we shall find the basis of our moral nature wrapped up in instincts,

and that they will show in their unfolding some bases for moral action. We noted, however, in connection with instincts, a distinction between animals and human kind which is most valuable in the study of morals; namely, that where in animals there is one direct response to instinctive impulse, in man there may be, in addition to this direct response, other supplementary responses to the same impulse. Due to man's increased mental capacity he is provided with a wide variety of channels into which the instinctive impulse is free to flow. We may go a step further and say that with succeeding ages there may be added still other avenues as outlets, and thus more varied and more complex responses.

While in man there are supplementary channels of response to instinctive impulses, the primary tendency is for the response to take place in a direct manner as in animals; and, except in rare cases, the opening of other channels is due to the repression of the primary mode and subsequent sublimation. Some moral actions may be thought of in this way; that is, the repression of the primary method, and the direction of the instinctive impulse and energy into more desirable channels. For example, we have been taught that we should repress the fighting instinct; the meaning of this was that we should not attack our enemies with tooth and claw. From infancy we have been told:

Let dogs delight to bark and bite,
For God hath made them so:
Let bears and lions growl and fight,
For 'tis their nature to.

But, children, you should never let
Such angry passions rise;
Your little hands were never made
To tear each other's eyes.

The energy and impulse of pugnacity took the line of direct response in the dogs and the lions and the bears, but were supposed to be restrained in children, and completely repressed in their elders.

However, they were not destroyed, for there seems to be a psychical conservation of energy as there is supposed to be a physical, and new outlets were opened. Instead of this immoral fighting, the energy appeared in a moral guise, and battles against evil and injustice were fought with equal energy and as gallantly won. Accompanying these victories were feelings of elation as gratifying as though our victory had been one growing out of a personal encounter with our arch enemy of another class, as when David slew Goliath. We have already called attention to the fact that the sexual instinct may be diverted from direct response, and turned into other creative channels; further illustrations might be equally well presented regarding other instincts.

We have been led to view the fall of Roman civili-

zation from the standpoint of eugenics, and to recognize that it was due to a deterioration of the racial stock, on account of the mating with slaves brought from the ends of the earth. Undoubtedly this hastened the time when Roman dominance should cease. There may have been, however, a supplementary cause of a psychological nature. It may be expressed somewhat in this manner. With the continuous Roman victories over a wide stretch of territory, which caused Rome to be recognized as the Mistress of the World, slaves, the trophies of war, were brought to the homeland in great numbers, so as to make it unnecessary for the Romans to lift a hand. Coming from all countries and being learned in all arts, these slaves anticipated and met every Roman want. The Romans were surfeited with leisure, and following the path of leisure inevitably came indulgence. With no demands and no restraint, indulgence of instinctive impulses naturally took the direct route, and primary or animal responses would be the rule. There were no repressions, there would be no sublimations, and morals would naturally be lacking. History confirms this view of the state of affairs in Rome, and we recognize the low moral condition of that time. Morals seem to be dependent upon repressions.

It was not only in morals, however, that this lack of repression exhibited itself. Indulgence would naturally show itself, as indeed we know it did, in sexual

license. The sexual impulse is the basis of creative work, and, when sublimated, shows its energy in other creative functions. With the license and sexual excess displayed by the Romans, sublimation ceased, and consequently the creative work of the Romans in the arts and in government, for which they were justly celebrated, also ceased, and Rome and its civilization fell.

Among the writers who in the past have endeavored to give us a solution of the question of the origin of morals, some have emphasized one instinct, some another, as the probable basis for our moral nature. Others, again, have emphasized the combination of more than one. The probability is that all the instincts have had a share—not an equal share—in the moral impulses, and that the intellect has directed these impulses, through experience, to give us our present moral practices. The keynote of morality is altruism, if we view the matter from the practical standpoint; or sympathy, if we emphasize the emotional element. In fact, Sutherland has defined morality in terms of sympathy; he says, "Moral conduct is that conduct which is actuated by a wise sympathy," and he divides the virtues into groups according to their being essentially sympathetic, indirectly based on sympathy, and those which are moral only in so far as they are sympathetic. The search, then, is for such impulses or instincts as,

either in themselves or when developed, show altruistic or sympathetic factors.

In the lower forms of animal life we can discover no evidence of sympathy or of altruistic impulse. Even as highly developed as are the ant and the bee, they show no apparent sympathy. It is true that their instincts impel them to work together, to tend their young, and to sacrifice themselves for the benefit of the colony, in a way to cause admiration and astonishment; but either insect will pass by, or crawl over, a wounded comrade with total unconcern. We may say that they do not recognize the suffering and need of the companion; probably not. We may also say that they do not recognize what they are doing when they spend themselves for the care, defense, and improvement of the colony. If we are to trace altruistic impulse to the lower animals, we are not at present able to go below the vertebrates for evidence.

Even here we are not very successful in the lower forms. Fishes or reptiles may congregate for defense or for food-getting, but seem to be unconcerned with the care even of their own offspring; in fact, they may even devour them. It is probable that we find no real sympathy below the warm-blooded vertebrates, birds being the lowest form to show this quality. Probably the sympathetic instincts of birds may be traced below them to some unsympathetic

form, but for our purposes we are only concerned in finding sympathy below the human species. There seems to be some relation between the beginnings of sympathy and the development of the voice, the ability to make and to hear sounds being a great advance in the method of communication, and communication being apparently a necessary prerequisite to sympathetic action. Perhaps we may say that the more complete the method of communication, the more likely we are to find sympathy.

As limited as is their vocabulary, we have no trouble in understanding the language of birds. We distinguish notes which signify danger, warning, food, joy, or love; and by their actions we know that birds of the same and of other species receive the same meaning from the sounds. With such communication, social sympathy is inevitable, for a bird cannot well receive a note of warning without acting on it. It is easily understood how such coöperation aids in the continuance of the species. Some birds cooperate for food-getting, for defense, for aid to the wounded, and all with apparent understanding of the object of their actions. For example, crows, and some other birds, set sentinels, which attend strictly to business and warn the flock of approaching danger, not feeding when the others do. A volume might be filled with examples of intelligent coöperation among birds.

It is, however, among mammals that we obtain our best examples, and it is apparent that this element of sympathetic action and coöperation increases as the intelligence of the species advances. In the higher mammals we see well-defined family groups and herd action showing intelligent coöperation and altruistic acts of such a character that there seems little doubt that real sacrifice is intended. A dog may not understand theoretically what he is doing when he warns his master of danger, and, refusing to flee, remains in the danger to help save the life of his master, but he surely does understand his own actions practically. It is in control of impulse that we have a test not only of intelligence but of morality, and a dog does at times control impulses, not only as a result of training, but as a result of sympathetic response to a need of one of his own species or of his master. Where a real purpose is involved, contrasted with mere impulse, we must see the beginning of what later develops into morality, if it has not already arrived.

It has been pointed out that what we call morality in man has a forward look to ultimate good, but that animals respond only to immediate need. Well, perhaps so! But are we so sure of our human morality in this connection? Thorndike seems to disagree with this distinction. He says, "We fear, not the carriers of malaria and yellow fever, but thunder and the

dark; we pity not the gifted youth debarred from education, but the beggar's bloody sore; we are less excited by a great injustice than by a little blood." This seems to indicate that our reactions are instinctive rather than rational, and are excited by immediate stimuli rather than by remote ends regardless of how praiseworthy they may be. But the fact that some man sees the incongruity of this, indicates that the ideal to which we are tending is an ultimate good which reason points out to us. This is but an example of a higher response to an instinctive impulse of which the human being is capable.

While the instinctive impulses are just as strong and irradicable in man as in the lower animals (and we must deal with them as such, and hope that we can show how the moral life is impelled by them), there are two differences to be noted which have a deep influence on morals. In saying that owing to man's superior intelligence there are more channels open to a response than in animals, we may be stating but half a truth; the other half may be that the higher in the scale of intelligence we go the more general and less specific the impulse is. These two half truths are supplementary—one may be the cause and the other effect—at any rate they make moral action out of instinctive impulse possible. The other truth concerning instincts which affects morals is the fact that in the human infant, compared with the animal

offspring, there is less accomplished before birth and more afterward. While this leaves the human infant less able to fight life's battles at birth than his more humble cousins, it does permit the training of the instincts of the human infant while they are developing. If it is in morals that the intelligence of the individual and of the race is to influence the instinctive impulses, this opportunity to begin before the impulses are set and specific is most valuable, especially since the instincts are impossible to eradicate—if, indeed, we should wish to eradicate them.

We sometimes see it stated that certain instincts, which make their appearance comparatively late in human beings, appear suddenly. This is not the case; they take years in maturing, and these years are a great moral opportunity. In like manner, those instincts which disappear do not do so suddenly, but are usually more gradual and later in life than commonly stated. At any rate the influences of their disappearance on morals is negatived by the fact that the moral result to be attained by such instincts is by that time crystallized by habit, and for good or evil is a part of the nature, as firmly fixed as the instinct itself.

At certain definite periods in the life of the human child he is provided with certain instinctive impulses to action, and by the time he passes his adolescence all these impulses, guided by training, influenced by

his own intelligence, and modified by circumstances, are in operation, and some on the decline. They have not come haphazard, but can be traced back to the instincts which existed long before man appeared, just as definitely as his own bodily organs can be traced. Sutherland, in his monumental work, has tried to show how selection, even in historic times, has had its effect. He says: "It may seem fantastic that within historic times actual physiological differences of nerve structure can have been developed in the race. Yet it is a sober fact, though demonstrable as yet by only indirect proofs. For we have seen that the man who is a good father, a good husband, and a good citizen is the ancestor of many progeny, while the Napoleonic type of abundant brains but deficient sympathies, even though it makes a brilliant career, perishes in a century or less from off the face of the earth. . . . One might have turned out a murderer and been hanged, another a robber and have been shipped to the plantations. One might have been killed by his own youthful immoralities, another refused a wife because of his disorderly life. In short, it is no exaggeration to say that out of 1000 possible ancestors, fifty would, on an average, be eliminated through the failure of parental, conjugal or social qualities. Indeed, in Elizabeth's time, out of every 1000 persons born five were actually hanged, as a matter of recorded statistics. But brawls, venereal

diseases, and so forth were far more potent cleansers of society. Those thus eliminated would be replaced by men and women of better stock, and so we may feel sure that at each generation a steady 5 per cent. of the poorer type was withdrawn, leaving room for the expansion of those richer in sympathetic gifts. But the power of such a steady withdrawal, acting in cumulative fashion, is enormous when spread over a sufficient time; even 300 years are quite enough to produce visible effects; indeed, if we had a means of sifting the people of Queen Elizabeth's time into two equal sets, those who could pass in those days for fairly good men and women, and those who were more or less distinctly below the average of moral conduct, it would be found that practically none of the inferior blood flows in the veins of the present generation; we being bred almost wholly from the better stock." To this Thorndike replies: "The difficulty with such argument is, of course, the abundance of contrary cases. Were the brutal husbands hanged, or did they drive their long-suffering wives to early graves? Were the cut-throats and brawlers or the reformers and idealists debarred, by death, disgrace or imprisonment, from having offspring? Many patient researches must be made before anybody can be sure of the relation of selection for survival and reproduction to any of the important original tendencies in man, for even ten generations back." It is

true that research is necessary to make us positive, but Sutherland also points out that there has been some alteration in nerve reactions in favor of sympathetic action, for some reason or other, for our women of today could not endure the bloody spectacles in which the Roman women revelled. Without doubt we are living in a time of less cruelty than in any age which the world has seen.

Maudlin and misdirected sympathy which, in this country at least, is wasted upon criminals, is working against the selection which was so effective in the reign of Elizabeth. Today, in the United States, murder is one of the safest enterprises, and can hardly be classed as a hazardous occupation. We have from eight to ten thousand homicides in the United States every year. According to statistics compiled by the Metropolitan Life Insurance Company last year, out of every one hundred and forty-six of these only sixty-nine indictments were found, from which thirty-seven persons received prison sentences, and one was executed! The record in New York City was far more unfavorable; the Whitman Committee found in 1920 that there was only one murder sentence to every six hundred and seventy-nine killings of all kinds in our metropolitan city. From the records of the city's Chief Medical Examiner and from the courts, it has been found that in the seven years, 1918-1924 inclusive, there were nineteen hundred

and nine murders and two hundred and thirty-one convictions. How many of these convictions were for murder and resulted in execution was not stated, but probably not many. Contrasted with this unenviable record, Great Britain and her dominions are keeping down the number of homicides to about one-fifteenth of ours, in proportion to the population; and in England about ninety per cent of the murderers are either executed or commit suicide to prevent the inevitable execution. In 1921 there were two hundred and thirty-seven homicides in New York City, while the whole of England and Wales had ninety. In 1924 New York City had two hundred and sixty-two, and London had sixteen—one to 500,000. The United States leads the world in its homicide rate, and Italy, with half the United States rate, is second.

Regarding earlier ages, when intelligence was limited, and, on that account, the struggle for existence was individual rather than social, it is necessary to recognize that the fighting qualities of the individual were the most important qualities. The sharp claw, the strong tooth, the swift foot, the savage temper, the selfish nature, all counted for the individual and for the species. With changed conditions of intellect it is evident that the moral and social qualities which we possess are valuable, and as such have helped our species to survive. The victory is no longer to the swift and to the strong, but to the wise

and to the good. Certain persons, who have not believed in evolution, have complained that according to this theory nature is careless of the individual, but careful of the species; even so, is not this the very condition which the Christian doctrine of love and sacrifice also espouses? Every baby brought into the world, helpless as it is, is dependent upon love; and a race without love would soon be exterminated, or would exterminate itself. Nature, morals, and religious teaching combine to demand the sacrifice of the individual parent for the race. No one would say that selfishness is entirely eliminated, or, indeed, should be eliminated; but the nicely balanced combination of selfishness and altruism is aiding in the preservation of the race as at present constituted. We may think of our moral qualities as being still on trial, on account of their unstable condition; but if they succeed, as they now promise to do, we may see the time when warfare shall give way to coöperation, when force shall be superseded by reason, and when the meek shall inherit the earth.

It may be fitting for us at this time to ask ourselves what are the instincts to which we are primarily indebted for our moral nature. Taking it as axiomatic that altruism and sympathy are the bases of morality, we find not one but several instincts concerned. Sutherland and, later, McDougall, lay emphasis upon the parental and conjugal instincts and relations,

which with the accompanying "tender emotion" are the earliest form of social feelings, and the family which they build up is the birthplace of moral relations. On account of the quality and intensity of these feelings and relations they spread first to other relatives, then to neighbors, and finally to members of one's own species generally. Of course there are exceptions to this extension, and likewise we may find exceptions to its beneficial influence, but in general both are true.

Added to the parental and conjugal instincts as a basis of sympathy, and thus of morality, by both of the above authors, is the instinct of gregariousness. Some psychologists do not consider gregariousness as a primary instinct, but one derived from such others as parental, conjugal, and self-preservative. However, there is much in favor of classing it as a primary instinct. It is not experienced by all animals, but those who are gregarious seem to suffer if deprived of the presence of the herd. Physical loneliness and, among higher animals, intellectual solitude can only be overcome by the presence of others of the same or similar species; and animals who have been isolated, when returned to the flock or herd, are not satisfied simply to be near, but rush into the midst of the herd and seem to wish to touch, and to hide among, the others. There seems to be no doubt but that this instinct makes the members of the herd

more friendly, and by this means they definitely cooperate for defense. It thereby comes to be the basis of loyalty to the flock and to the species.

These three are the instincts from which Sutherland considers sympathy to be derived, and hence are the basis of all morals; McDougall adds others which he considers have contributed to moral tendencies. Pugnacity, so strong in all animals under certain conditions and so necessary for self-preservation, has connected with it the emotions of resentment and revenge. These emotions develop into indignation when social ideals have advanced so as to recognize certain actions against the group, and later give rise to ideas and practices of punishment and criminal justice. The instinct of pugnacity, with accompanying rivalry and competition, has always been recognized as a valuable instinct from the standpoint of the preservation of the individual and the species, but has sometimes been looked upon as a necessary evil. Morality has tried to adjust it, but has seemed to think that the proper course is to eradicate it. We recognize the value of the impulse in morality and in the preservation of the species today; by changing the method and the object of the attack from the physical encounter with other individuals, or the mass encounter in war, to the combat against injustice and greed and to the battle against disease and organized crime, we may indulge the impulse to its

utmost, and only good can result. Further, there are the instincts of acquisition and construction, which give rise to ideas concerning property and to the moral judgment with which they are connected. Finally, there are the instincts of self-abasement and self-assertion, called by some negative and positive self-feeling; while self-abasement is the subjective basis of respect to superiors, divine and human, out of self-assertion grows our idea of rights. They also furnish a basis for self-respect and self-condemnation.

While these are the instincts which have played the largest part in the development of the moral nature, McDougall would not say that others have not aided. Indeed, others are included in the formation of sentiments which have a distinctly moral tone. It seems most likely that all the instincts have contributed to the development of the moral nature, and are essential to the formation of the highest manhood, to the well-being of society. While we speak of different instincts as being responsible for a certain act, there is no clear-cut division between instinctive impulses, and several may combine to bring about an act which we name by the impulse which we consider chiefly concerned. Many writers designate certain instincts as primary or elemental in the formation of morality, and perhaps one phase of morality, such as sympathy, as the basis of the moral nature; in most cases,

however, supplementary instincts are recognized in the process, and derived or more complex ethical elements are admitted to be present.

The instincts which have been named, and others too, form the positive factor in the development and present expression of morals. In dealing with the positive factor and in emphasizing it, we must not forget an important negative factor referred to in an earlier part of the chapter. The repression of certain instincts is the negative factor, but the negation of the primary expression of an instinct becomes a positive element when the instinctive impulse expresses itself in some other form of which the moral sense can approve.

It is altogether likely that in the endeavor to simplify the impulse and the product, we have neglected to recognize the complexity of the process. We see certain impulses inhibit others, and under certain circumstances modify them considerably. On the other hand, circumstances may be such as to strengthen certain instincts, which in turn aid in the expression of others. For example, the parental instinct, with its prolonged expression in the human race, has modified the sex influence by substituting feelings of common interest for the physical sex impulse. Coupled with both of these, the instinct of acquisitiveness has functioned so that a feeling of ownership has modified both, and such derived feel-

ings as sympathy may in certain cases still further modify the original impulse. It therefore becomes very difficult, if not impossible, to designate any single instinct as the basis for moral nature, and more and more certain that practically all of them are involved. When we pass from animals to even the lowest men, we find less concentration and more amalgamation of instinctive action, a broadening of sympathy, and a correspondingly greater development of morality; but in no case is there any doubt about the source of the human reactions, even if the elements are somewhat differently compounded in human beings than in the lower animals.

It may be a matter of present interest to suggest that the modification of the physical sex impulse by the parental instinct, just referred to, may have an influence on a condition that merits our attention. In 1923, the latest statistics available, there were 165,-139 divorces in the United States! This was an increase of 16,324 over the previous year. The ratio of divorces to marriages for 1923 was one to seven and four-tenths, for 1922 it was one to seven and five-tenths. The state of Oregon had one divorce for every two and one-half marriages, while our neighbor, Canada, had one divorce for every one hundred and sixty-one marriages. It seems as if, in this country, at least, the sex impulse may have been modified, but the parental instinct has not been correspond-

ingly increased. Has not the time come to examine the ideal of marriage with the aim of putting it on a moral and social basis? Now the common notion of marriage seems to be the union of two persons to satisfy selfish desires—high or low—and religion and poetry have combined in the past to emphasize this. Should not the subject be rescued from this anti-social and immoral ideal? While the attraction of two persons for each other can never be eliminated, and should not be if it could, the hope of marriage, decried and assailed as it is, must be in an emphasis on the parental instinct and all that accompanies it. We must get marriage on an altruistic rather than on a selfish basis. Interest must be transferred from the two individuals originally involved, and how they happen to feel toward each other under certain circumstances, to the offspring, how they are progressing, what contribution they are making to society and to the race, and how that contribution can be increased. Incidentally the common interest evolved by this means would correct some of the antagonistic feeling engendered by the ennui of each other's presence, when the mutual attraction of the first few years has declined, and the care of children, which nature intended for a first aid and substitute, has not come to reinforce it or to take its place. Selfishness, one fruit of which is childlessness, is responsible for the deplorable divorce conditions, and the altruistic

element must be restored in the marriage relation, the proper means being through the exercise of the parental instinct.

While instincts furnish the impulse and lay the general foundation for the moral life, we must not forget that reason, which might also be classed as an instinct peculiar to the higher animals, must guide in order to have the highest development of morals. Reason has a great advantage, which must not be neglected, for not only can the individual use his intellectual power modified by his individual experience in his problem, but he has as a guide the organized experience of the race. Some authors seem to emphasize emotion as the keynote of morality even to the entire exclusion of reason; but if that were true in primitive races it would be less and less so in future generations, for reason must take its rightful place and guide the impulses which instincts provide.

The Puritans, guided by a one-sided interpretation of scripture, insisted that all instincts and natural impulses were wrong and should be suppressed. The person who first formulated the doctrine of total depravity must have been unfortunate in his friends. In any case, there it was, and Jonathan Edwards made the most of it. Opposed to this there have been others, of whom G. Stanley Hall was foremost, who contended—rather inconsistently to be sure—that all of our natural impulses were right. Neither one of

these positions is correct. Fortunately, through the intelligence which man possesses, he can judge so as to encourage the right, redirect the wrong, and guide all to a higher development. This power of self-conscious evolution, this ability to change himself to correspond with his higher ideals concerning himself, is the glory of his existence and the hope of his species. He can only take himself as he finds himself, but that is no excuse for leaving himself that way. Sublimations do not come suddenly, and trying to modify and redirect harmful impulses is a slow process; the whole trouble with being good is that it is such a long task, but both for the individual and for the race it is one which is worth while. In the past, experiences which did not assist in survival were called evil—usually they dealt with immediate results; the same thing may be predicated today but with this difference, we are now able to judge values from the standpoint of ultimate good—or more nearly so—and that inevitably means from the standpoint of morality, for morality must consider ultimate values.

CHAPTER VII

IS RELIGION NATURAL TO MAN?

IN a previous chapter we have noted the high place which the moral and religious elements hold in the life of man, according to the evolutionary hypothesis. With us, today, the two are so intertwined in their recent history, and, to a less extent, in their practice, that it is difficult to separate them. Investigation in the more remote history of both, and examination of primitive races and tribes still living, show a wide variety in their relationships; we find religion with little morality, and morality with little religion, and all sorts of combinations. As the highest development of mankind, it is worth while to investigate them to see their relationship to the intellectual life of man. We found that we could trace the independent development of morals; let us see if we can do likewise with religion.

In an endeavor to solve the question of the origin of religion there are two tendencies, both of which were more prominent in discussions a few years ago than now. The first is to affirm that religion is an instinct—an instinct common only to man. The second tendency is to deny the first contention, and then to endeavor to prove that religion is derived from, or is but another expression of, some one instinct. For

instance, we have such expressions as, "The differential essence of religion is always reducible to sex ecstasy"; "The religious sentiment is composed first of all of the emotion of fear in its different degrees, from profound terror to vague uneasiness"; "The individual of the gregarious species can never be truly independent, and self-sufficient. . . . This is the psychological germ which expresses itself in the religious feelings." The reason why these and other theories, founded on the idea that a single instinct is the origin of religion, have found acceptance is that they contain an element of truth.

It is not necessary to examine very far into religion to see that no one of these three instincts is sufficient to account for the origin of religion, or for its development as we now know it to be. Fear and the desire to propitiate an angry and powerful divinity undoubtedly account for some of the rites and ceremonies of early religions; gregariousness accounts for the social element in connection with ceremonies conducted by or for a tribe as a whole or by any number of people; and the sexual element implies the recognition of the value of fertility to the welfare of man, and accounts for further ceremonies. Gregariousness cannot account for the personal relationships which are an important element in religion, fear cannot account for the faith and love elements, and sexuality fails to account for either of the others.

These three instinctive factors are used simply as illustrations; and others, which are sometimes set forth as important in accounting for religion, might have been used equally well.

If religion has always been an expression of the total mental life of man, as we believe it now is, we should expect these three instincts to be important in the development of religion, for they were influential in the early history of the race. If infant mentality recapitulates that of the race, we can affirm the strength of fears in early man on account of their prominence in early infancy, where they are easily aroused, but not always present. In awe and reverence, two of the emotions which now play a conspicuous part in the religious life, fear is an important constituent. It is noteworthy, however, that Jesus, Mohammed, and other great religious leaders did not find fear a propelling power in their lives, and that fear as a motive in religion is becoming less and less powerful. Gregariousness also appears early in life, and, according to some of the late investigators in psychology, psychological sexuality is an infantile characteristic.

We may go a step or two farther. Fear is definitely connected with self-preservation, or, as we are more apt to speak of it today, self-realization. Among the high ideals which we wish to set before our youth, those of self-realization are among the highest. The

great examples, the great heroes, the great patriots are those who have reached the greatest heights of selfhood; and we point with pride to such persons, realizing that they have touched the borders of the divine. Yet, cannot the success of such realization be attributed directly or indirectly to fear? Gregariousness also is an instinct, the fruit of which is found on the loftiest boughs. Among our most cherished ideals are those of friendship and companionship, so desirable that we trust they will never cease; so beautiful is the ideal, that we have pictured it as one of the characteristics of heaven. This is also true of the highest ideals of self-realization. The sex instinct has been indissolubly connected with love, and human nature knows nothing finer or more beautiful; it is the theme of the poet and the analogy of the religious seer. Whatever may be our objection to the raw instincts, in our search for religious origin, there can be no objections to their developed states as constituent parts of the finished product.

However beautiful these elements may be, religion is certainly not any one of them or merely a combination of them as such. It is a new experience. May we not return to the reference to isomerism which was made in the second chapter? Then it was affirmed that like elements in combinations formed very unlike products. Unlike elements in combination would form, not a simple sum of these elements, but a prod-

uct even more unlike the original elements. Chemical combinations may furnish examples for us: oxygen, which is necessary to combustion, and hydrogen, which is highly combustible, form water, a product which is destructive to combustion. Religion may be traced to certain elements, but the product is different from any of them or all of them.

We have already seen that the test cannot be by origins, and that in evolution there is a continual creation. The new is a product of the old, but there is something additional, uniquely characteristic of the new. Every psychic element cannot be analyzed into something more simple or more aged; there are certain emotions which are those emotions and nothing else. We have aesthetic emotions which accompany aesthetic experiences and no others. We have certain taste experiences which can be aroused by certain objects and no others. In addition to the elements into which we can analyze our religious emotions, there are unique elements, which are experienced at no other times, and can be aroused in no other way. We have no reason to think, however, that these unique factors are other than the result of combinations, even if the total experience contains a factor in addition to the sum of the elements.

Religion is not an instinct, neither is it founded on a single instinct; but it, as nearly as any possible human experience, comprehends the total mental

capital of the human individual. The evolution of religion has not depended upon some small addition here or upon some small subtraction there, neither has it been brought about by a sudden flowering of some particular trait, however beautiful it might be. It is not to be accounted for, either, by the sudden sloughing off of a particular, undesirable trait. Religion is the result of the evolution of the whole human personality and was made possible only when the evolution had progressed so far as to include intelligence. While we have the instincts of sex, fear, and gregariousness in the lower animals, we have no religion, nor anything approaching it, for there is not sufficient mental ability either for its origin or for its continuance. On the other hand, ethnology knows no portion of the human race devoid of religion. If one looks over the list of human instincts as given on a previous page he will not find one which does not enter in as a factor in religious experience; likewise, if one prepared a list of strictly intellectual factors, he would find that they, too, are prominent in religious experience.

There are no innate factors as clearly belonging to religion as there are to morality. Moral obligation is a unique element which has no counterpart in religion. There are no emotions which are individually peculiar to religion, but their combination provides the characteristic which we call religious. Awe, won-

der, fear, love, and other emotions may be used in other experiences, but never in the same relation as in religion. There is also a special dependence upon abstract ideas, which calls for a high intellectual development, and gives body, elasticity, and lofty character so noticeable in religious experiences.

If it were necessary to classify religion, perhaps we could do no better than to designate it as a sentiment, according to the McDougall definition, except that it would be more comprehensive. McDougall, following Shand, defined a sentiment as "an organized system of emotional tendencies centered about some object." Sentiments have their origin in the native reactions of instincts and emotions, but differ from both in being more comprehensive and more complex. Wright points out that if religion were a definite instinct it would not be capable of evolution except as instincts are, which is slowly if at all; if, on the other hand, it were propagated by imitation and suggestion it would change as rapidly as do the fashions. As a sentiment, however, it is conservative in its changes, like customs, morals, and institutions.

While we are able to track the moral nature of man into animal life and can closely trace the descent, we cannot say the same of religion except in a very indirect way. There are certain animal emotions and instincts of a non-religious type, which when later found in man contribute somewhat to human reli-

gious life, but do so only in their human form, guided by human intelligence, and reacting to human social conditions. The fact that so many different people find so many different virtues as the one source from which religion is derived, shows its very complex nature.

We have every reason to think that religion has had a natural history and development, that there was a time in the history of the race when religion was unknown, that it originated as other mental attitudes and sentiments have originated, and that its development has followed the laws which the impulses and social environment demanded. From the nature of the case its origin would be later than that of moral conduct, but after the beginning they developed side by side. The latter consists, among other things, of the inhibition of instinctive impulses of the individual, in order that he may conform to social customs or demands. This could have, in a crude way, considerable force in the early days of the race, when intelligence was not developed beyond the practical stage. Religion could not be possible until man began to philosophize and to ask, "Why?" The answer to that question was probably, from the beginning, centered around beings superior to man, and has developed in a tortuous way until it has arrived at the exalted conception of the Christian God. This asking

why, this craving for causality, links up religion in its origin with science.

In most discussions of the origin of religion we usually find the emotional or instinctive element emphasized, or perhaps both. Rarely do we find that religion is very closely united to an intellectual factor in the theories of beginnings. Yet we see that until the intellect had developed to the human level religion was unknown, showing that the intellectual element, even if it were used for no other purpose than that of organizing or directing the emotional and instinctive factors, was necessary to the appearance of the religious life. It should further be noted that the intellectual instincts and emotions, as, *e.g.*, curiosity, wonder, and awe, have a prominent part in most theories of religious origin. The intellectual element in present-day religion is supposed to center around the creed. This is far from true; the creed has come to be a part of the ritual to be repeated, rather than an element incorporated into one's beliefs. The intellectual factor is more often indicated by the philosophical question, "Why?" and may show itself more frequently in an endeavor to find a rational basis for beliefs and practices than in the uncritical acceptance of a creed prepared for other people and for other times.

The intellectual element may also show itself in an attempted reconciliation or in a supposed warfare be-

tween science and religion. It is probably incorrect to state the issue this way, but it should be said, "between sciences and religions." Some sciences seem never to conflict with some religions, while others are in continual disagreement. The basis of both science and religion is the same; namely, intellectual curiosity: and if we are living in a *universe,* curiosity must be satisfied in a way which will be antagonistic to neither. An evolutionary basis for both must permit of advancement as new facts are presented, and as new problems call for solutions. Religion and science must adjust themselves mutually, as two sciences must do, and each adapt its theories to new knowledge as it is revealed. Only thus can the intellectual element be satisfied in both.

As far back as we can trace them, religion and morality were not very closely connected. Religion was very slow in linking itself up with morality, and remained non-moral even among the Babylonians, Greeks, and Romans. It was purely ritualistic. Homer's gods had no interest in their own moral conduct, much less in the morals of those who worshipped them. Later, morality, as the highest type of mental reaction, was attributed to the gods, and the moral level of the people thereafter could be determined by the morality of their gods. For example, we can see how prominent fear was in the religion of the people by the sanguinary sacrifices which they

thought necessary to offer to their gods; we can calculate the stage of sexual morality of a people by the rites and ceremonies performed in religious worship.

Morality and religion have been very important to each other: morality has given body and weight to religion, and religion has given sanction and authority to morality. By their fusion, the combined wisdom of social inheritance and latest intelligence has been incorporated into religion, and the sacredness of religious conceptions has been transferred to morality. This combination must have had a survival value in man, or it would not be so universally found; moreover, the fact of its universality indicates an early origin in the race.

In a universe, no part can be alien or antagonistic, but each part must be coöperative and helpful. If intellect is a part of the cosmic process, and we believe it to be an important part, its function in the universal scheme is not creative but guiding and directing. With each advancement in mentality the regulating power of the universe is increased. Thus the addition of intellect to the instinctive life developed new methods of adaptation and aided in the possibilities of the extension of life. Intellect has proved to be not only a valuable aid in direction, but a great addition to human, and hence universal, power. With every increase of power, however, there

is an insistent demand for further regulation,—for more careful and exact direction. This function the moral and religious life of man supplies, and its importance cannot be exaggerated. Intellectual decay in the mass or in the individual is shown by, and naturally follows, moral and religious decline. We can easily recognize the immense importance of religion in the early history of the race, especially in giving a broadness and a solidarity to the social group; but it seems that our proximity to the situation prevents our recognizing its equal importance to present-day problems and conditions. The very fact of our great increase in social inheritance demands the most extensive use of every guiding and regulating principle.

While religion is not the result of one specific instinct, and its expression is conditioned by social environment, it is none the less a development from innate impulses. It is a complex characteristic inherent in the very structure of the human mind, and its expression fulfils a need which must be recognized, not only by theologians, but by biologists. It is usually connected with morality and preferably but not necessarily so. A lack of religious experience is a loss to man as he is at present constituted, and, in fact, as he always has been constituted so far as we are aware.

Is religion natural to man? It is not only natural but inevitable. We recall, in this connection, Saba-

tier's saying, "Man is incurably religious." Given his history, showing the various psychological factors of his make up, when sufficient intelligence had developed the natural result was religion. Then it appeared with all its crudities and imperfections, to be gradually refined as intelligence and its concomitants developed. The question is not, and never has been, "Is man religious?" but, "What kind of religion does he have?" Our philosophy of life, especially as it is related to our idea of a first cause or creator of the universe, will determine the kind of religion we shall have, and its moral connections and requirements will determine its practical application.

CHAPTER VIII

HAS INTELLIGENCE INCREASED IN HISTORIC TIMES?

THERE have recently been certain facts brought to our attention, which in the hurry and excitement of these modern days have made little impression upon the general mass of humanity, but have deeply stirred a few thinkers. They have come principally in the form of warnings, and have led some to speculate on the destiny of intelligence. The tendency of evolution has been, on the whole, in the line of advancement; but there are not wanting numerous examples, along the way, of species which have attained a comparatively high status, and have subsequently degenerated. We understand that man is subject to the same laws as other animals, and as we have risen so we may fall. These warnings have led us to formulate certain plans looking to the elimination of more or less well-defined degenerating tendencies and practices. After all, it is the high development of intelligence which is man's distinguishing characteristic, and it is worth making some effort to retain it.

We shall never know exactly how long it is since man appeared on the earth, and from the nature of the case the time must be very indefinite, for his ad-

vent was gradual. Anthropologists place the time of the Crô-Magnon man, the oldest specimen of our present species, at about 25,000 years ago, and believe that the Javan specimen, the oldest known human form, lived a half million years ago. It is natural and legitimate to ask whether there has been any development of intelligence since the time of the Crô-Magnon man, for 25,000 years seems sufficiently long to note a change. Unfortunately we have not the data upon which to found an opinion, for our definite facts are confined to historical times, say three or four thousand years, and that, certainly, is too brief a period to act as a foundation for any definite statement concerning the advance or retrogression of the species. This much may be said, however: so far as it is possible to found an argument upon the parallelism existing between the brain size and intelligence, there has been neither advance nor retrogression; for though the brain of the Crô-Magnon was really larger than that of the modern, average man, his whole body was larger—the ratio between the weight of his brain and his body being about the same as that of the average modern man.

Some have thought that the differences existing between the various races now upon the earth show the progress of man since his first appearance. It has already been pointed out that this would be strictly true only if we knew that these races followed the

same line of development as did the ancestors of the higher types. It would not be difficult to arrange the different races in a graduated scale according to intelligence and knowledge so as to present a fair illustration of man in his development. Before this can be done to any advantage we must have more agreement among anthropologists, and have them answer for us some pertinent questions. Where did man first appear, and consequently which are the oldest races? Did man have more than one birthplace, *i.e.*, did he develop from different stocks and appear at different places, even if not at the same time? What was the order of development of the different races? The most primitive races today live a life not unlike the life which we should expect the prehistoric man to live, and which the evidence from recent discoveries shows that he did live. In other words, limited intelligence circumscribes life and leads different people to do the same things and to do them in the same way.

Anthropologists are not only showing us the wide differences in intelligence between the different races of men, but recently have differentiated certain fundamental stocks in the white race and designated certain physiological stigmata. These stocks are the tall, fair-skinned, blue-eyed, light-haired, long-headed Nordics, inhabiting the northwest of Europe; the sturdy, short, dark-skinned, darker-eyed,

brown-haired, round-headed Alpines, inhabiting the central east of Europe; and the small, dark-skinned, black-eyed, black-haired, long-headed Mediterraneans, inhabiting the south of Europe. In addition to these physical characteristics, there are also accompanying mental characteristics; the Nordics, for instance, showing the greatest intelligence, an adventurous spirit, and a talent for leadership. It is quite evident that the light hair, eyes, and skin are furthest removed from the original type of man; if intelligence is a matter of development, we should expect that the type furthest removed from the original might be the one in which the intelligence has the greatest development. The accomplishments of the people who conform to these types lead us to the conclusion that Nordics are superior in intelligence, and tests confirm this; but of course there are wide individual differences. These differences between the races of men, and corresponding differences between different stocks in the same race, show the variation from, and superiority to, primitive types, and give a very good illustration of the course of evolution, which is never in a straight line but in branching form, the main trunk of which is crooked and gnarled.

The outstanding development of different peoples showed itself in favored places, as in the river valleys of warm countries. These valleys, however, had suffi-

cient drawbacks to force the inhabitants to the highest uses of their mental powers in order to arrive at their high status. The outstanding examples are the valleys of the Euphrates and the Nile. One prominent illustration of the high development of intelligence, showing itself against a background of inferior people, is that of the Golden Age of Greece. Attempts have been made to link these Greeks with the Nordic race by those who claim the Nordic intellectual superiority. It is altogether likely that the general intelligence of the higher classes of Greece was as high as that of America today—perhaps higher. Galton considered the average ability of the Athenian race to be about two grades higher than the Anglo-Saxon at his time, *i.e.*, about as much higher as the Anglo-Saxon race is above the African negro. Cooley, on the other hand, produced a list of Englishmen born within a century, the century beginning at 1550, which he considers at least equal to the Athenian list given by Galton. Perhaps it is not fair to compare this group of Athenians with the Americans of today, for they represent a sporadic or freak bunching of intelligence rather than the regular development of the intelligence of the race. We have other examples of this beside the group of Englishmen born between 1550 and 1650. The seventy-five great Italian painters were born from the thirteenth to the sixteenth centuries, over half of them in one century

and the three greatest within nine years. The men whose writings form the literature of this country, and whose works are referred to as American classics, were born between the years 1783 and 1814. A group of great American preachers was born between the years 1813 and 1835. Other characteristic groups could be cited. The point is that such groups appear, do their work, and leave no successors, and consequently only groups on the crests of the waves should be compared, and not a group with the average in the trough of the sea. The average of the total inhabitants of Greece would not be any higher than, if as high as, that of America; for the lower and slave population would cut down the average. This high development was a variation which, from causes we shall discuss later, soon disappeared, and shows little trace in the Greeks of today. The point of interest to us in this connection is that when we compare those Greeks of three thousand years ago with the people of today, or with the sporadic groups which show exceptionally high powers in special lines, we find no development of intelligence. It has already been stated that this amount of time is insufficient to use as a basis for any deduction along this line.

This brings us back again to the question whether there has been very much mental development or if we are not deceived by other factors. Our increased

knowledge passed on from generation to generation—known as our social inheritance—leads one to think of our vast superiority to the Greeks or to any other former people; but should we be rash enough to affirm that had they been brought up in our environment they could not have comprehended the things which we do? We should probably all agree that they had sufficient mental ability to do so. It is our various forms of education which lead us to believe that our mental development is much more than it is. The number and variety of our schools and the unlimited multiplication of our courses lead us to think of, and to proclaim, a mental superiority which a more critical survey would deny.

There are also certain factors in modern civilization which seem to emphasize this deception. Crowded as we are into large cities the very mass leads us to mistake quantity for quality—we are able to bring such great things to pass. There is also a new expression of old traits due to sublimation caused by the repression which the congestion of large numbers engenders. Our forefathers on the farm and prairies expressed themselves freely and naturally, for they knew their neighbors for miles around and had known them for decades. Today, surrounded by persons unknown, with one's next-door neighbors total strangers, there is necessarily lacking the freedom and frankness of former days, and the resulting

repression causes our mental force to express itself in new and unconventional ways. This new experience, which is sometimes thought of as new power, misleads us into thinking of ourselves as superior because different.

There are other reasons why we think of ourselves as superior, probably much more superior than we really are, but I shall mention only one more. The variety of superiority or the specialization of intelligence leads us to think of the race as incorporating all of our many accomplishments and powers, when really any single individual possesses only one of them. This difference or specialization is due to nature's lust for variety. From the dissimilarity of individuals we may judge that she is willing to try anything once. The multiplicity of mental factors is united in different persons in various proportions, so that not infrequently we find some mental factors exaggerated at the expense of others. Patrick Henry could not write an understandable report; Washington Irving was tongue-tied. Blind Tom had marvellous musical ability, but intellectually was little above an idiot. Recently I visited an institution for feeble-minded where I saw a man with mentality so low that he was unable to learn to read or write—about four or five year ability—yet he could immediately tell correctly the day of the week of any date within forty years of the present—past or future. Mathematical autom-

ata, memory prodigies, and similar persons with apparent ability of very high quality in one particular are not infrequently of inferior ability in other respects. On the other hand, we find men of ability approaching genius in more than one department—Julius Caesar was a general, statesman, orator, and writer; Descartes was eminent as a mathematician and as a philosopher; Holmes was a physician and an author. Modern complexity hides similar all-around ability; Humboldt wrote an authoritative book on all the sciences, now no one can cover thoroughly a single field of one science. The point which I am trying to emphasize here is that mental differences are thought of as showing the development of mental power in the race, when they really show the variation in individuals and may have little or no relation to the mentality of the race as a whole.

Notwithstanding the assertion of the Declaration of Independence, it was never believed that two men were equal, not to mention "all men." It is neither self-evident nor capable of proof. Just what the differences are we are still unable to define fully or to measure accurately. A tremendously long step has nevertheless recently been taken. The advent of mental tests less than a score of years ago and their practical application during the last decade have made some sort of measurements possible; and the war, with its enlistment of vast numbers of men, com-

pleted the conditions whereby a wonderful experiment could be made. The measuring of the intelligence of two million men, and the critical study of three-quarters of a million records of men in the United States army were feats the significance of which has hardly yet been realized.

This experiment and the resulting measurements have provided us with means whereby mental differences can be more definitely valuated. The range of difference caused comment, and the number of those with exceedingly high score was noteworthy. The greatest astonishment, however, was caused by the number of low scores and the low average of this body of men which must be considered representative on account of the character of the draft. The results of these tests naturally caused a great deal of excitement and not a little discussion. Many took refuge in denial, for it was so much easier to make a blanket denial of the results than to face the facts and to try to remove or remedy the causes. Tests now so commonly given in schools and colleges have tended to confirm the results of the army tests, and there face us the stern facts which we must meet. Some of these dangers will be discussed later. For our present purpose, however, it is chiefly essential that we note two points in these results; namely, the wide range of difference in intelligence, and the fact that this differ-

ence when subjected to quantitative tests does not indicate a development of the intelligence in the race.

The so-called intelligence tests simply indicate the potential mentality of the individual as a result of heredity, and the wide variation in this one factor has been already noted. This, however, is not the only mental factor in which variation is prominent. Almost any other factor would serve equally well as an example, even if we have not tests by which to make quantitative measures. The difference in musical appreciation is well known. At one extreme we have the great composers whose names have become immortal, and at the other we have those to whom music makes no appeal, either to soothe the savage breast, or to provide pleasure and entertainment. Neither the beauty of harmonious sounds nor the rhythm makes any appeal. What is true of music is equally true of other forms of art.

Leaving the artistic, we find the same variation in the more practical activities of life. Of two linotype operators with equal experience, one may set twice as much type as the other. Of two insurance solicitors with equal experience and devoting their entire time to the work, one may sell three hundred and fifty times as much as the other. Of two coal miners with equal experience and equally favorable mine conditions, one may load twelve times as much coal as the

other. These results may depend upon motivation. The observation of Seashore that one man's ear may be three hundred times as keen as another's, however, precludes motivation and training entirely. Some people seem to have a genius for industrial organization, and every gesture results in increased production at lower costs; others are as apt in financial affairs. We have great inventors, the product of whose wonderful mentality opens up new worlds to us, and causes us to blame ourselves for not having recognized relationships which seem so plain after they are revealed to us. Great men of science, by dint of industry and ability, discover the laws of the universe and their application to everyday life. If we have these, we as surely have others who are unable to see the processes by which these marvels are worked out even after they are shown, and, for example, think that if a man of financial genius obtains money it must have been by dishonest means. Then we have all grades between these extremes so as to make a graduated scale.

Nothing is more apparent than mental difference, and if we think of the race as having developed on account of the geniuses, we must think of it as having degenerated on account of the feeble-minded. While we may be able to strike an average in connection with any one mental trait or power, it is difficult

for us to do so in connection with all of them. One thing seems to be incontrovertible: whatever else civilization has done for us it has given us opportunity to display and to use every vestige of mental power we have; and this wide variety of expression has undoubtedly led us to think of the race as having a high development when it may be only that we have had a better opportunity to exhibit what mentality we possess.

While it is thought by some that a study of art, which shows the progressive intelligence in the face, proves that evolution has been continuing in the last millennium, it is altogether unlikely that we can definitely say that the race has developed in historical times as far as mental power is concerned; again it may be said that the time is not sufficiently long for a test so that we can affirm that mentally the race is progressing or retrogressing. The reason why there has been so little change is not wholly due to the shortness of the time, but probably as much to the monotonous circumstances which have surrounded us during that time. If the same length of time were taken up by some catastrophic event, such as a glacial period, it is likely that the struggle for existence, due to the forcing of half the population of the world out of their homes, would facilitate evolution, and cleanse the race of much of its inferior stock. En-

vironment has never created ability; but by means of unfavorable conditions forcing mentality to its highest use and function, and thereby eliminating the unfit, it has helped in the development of the race.

CHAPTER IX

ARE WE IN DANGER OF INTELLECTUAL DECLINE?

THERE are certain dangers which threaten the development of intelligence in the human race, most, if not all, of which can be removed whenever we determine to remove them. When we become as much interested in human beings as we are in cattle, and swine, and poultry, we shall not take long to eliminate them, or to bring about conditions to rectify them. That we have tolerated them so long does not speak well for our intelligence, and particularly does it point to a lax condition of our morals. The time has surely arrived when we shall have as high a standard for racial and national intelligence and morality as we now profess to have for individual.

1. The first of the great dangers to the race is that of war. It is named first because the ravages of armed conflict are so apparent on account of the proximity of the last war. We can look back to the time in history when war was not such a one-sided scourge,—when there was something which could be entered upon the other side of the ledger; that time has now passed. At one time wars tended to purify the race by eliminating the weak; this was when personal conflict was the keynote of war, and not only strength of body

but mental ability might be the deciding element in the encounter. In these days of trench warfare, high explosive shells, long range guns, poison gas, and other contributions of modern science no selection can be made by the encounter itself. The selection which is made is in the choice of men who should go to fight. Men of weak bodies, weak nerves, and weak minds are rejected and not permitted to fight—only the fittest and choicest are chosen for cannon-fodder.

In such a pernicious system as that employed by Great Britain and her colonies and dominions at the beginning of the war, the results were especially bad. In a voluntary system, when armies are raised by enlistment, the finest types are the first to rush to the colors. We know what happened to the first armies. The weak physically, mentally, and morally held back, and some were never required to go. They are still left to propagate their kind. In scores of colleges throughout the Empire there was not a physically fit man remaining. In compulsory service like that of France, Germany, Austria, and Italy and in the selective draft in the United States the case was not so bad until the draft became severe; but even here the fittest men of the draft were chosen to fight, and the weakest were given other occupations. Young men with the strongest bodies and keenest minds were chosen for lieutenants; these lieutenants had to lead the charges, with the result that the mor-

tality among them was comparatively greatly in excess of that of any other ranks. The same selection and mortality were characteristic of the air service. Think of what it means to future generations to have a million of the choicest Englishmen, a million of the choicest Frenchmen, and a million of the choicest Germans slain or incapacitated in four years! The world can never recover from that loss; think not only what they would mean to science, art, industry, and government if they had lived, but what their descendants would mean through the ages! "Wars are not paid for in war time, the bill comes later," said Benjamin Franklin. If there is anything in the claim for Nordic mental superiority it is to be noted that the British, the northern French, the Belgian, the German, and many of the United States troops were of Nordic descent.

Another fact to be considered was that the loss was almost entirely from the white race. This was a white man's war, for the nerves of the other races could not stand the strain. The British tried Indian troops—but had to withdraw them; the French had some colored fighters, and so did the United States, but some of these fled in panic and had to be withdrawn. In most instances troops other than the whites were used as labor battalions, and consequently were endangered little if at all. If the white race is to maintain supremacy, it can ill afford the loss of either the

quantity or the quality of its breeding stock, such as it sacrificed in the last war. Moreover, what is true of the last war is equally true of other wars, though on a lesser scale. The Civil War in the United States, the War of the Roses and other civil wars in England, the Thirty Years' War, and many similar wars drained the best blood of the nations which contained human stock of superior quality.

If the scourge of war has been so disastrous in the past, what of the future? According to the reports concerning preparations in progress when the Armistice was signed in 1918, the terrors of the war as it was fought were mild compared with what would have happened if hostilities had continued six months longer. The impetus given by the late war to research along destructive lines evidently stimulated scientists to still greater effort. Especially is this true of the chemists and biologists, who have promised us methods of destruction for future wars compared with which anything known in the past would look insignificant and impotent. This destruction will not be confined to armies; but will be directed against nations in such a way that entire cities, men, women, and children, will be exterminated in a brief attack. It seems too horrible to contemplate; but we must remember that in the late war whole nations were mobilized, women in the munition factories as well as men in the trenches: the work of the one was as

important as that of the other, and the destruction of one was as significant as that of the other. The Germans adopted the idea of hostilities against civilians in their air raids on England, and we have seen that a nation in its extremity will stop at nothing. A future war is a greater threat to our breeding-stock than any past one has been, and it is a sad commentary on our intelligence even to admit the possibility of such a thing. Is it not time that our intelligence should really direct our instincts? We must recognize that any future war will be very little less destructive to the victor than to the vanquished. When the time comes that we shall use the energy now wasted in conflict to improve the race, a day of hope for intellectual development will have arrived.

During the Middle Ages a mistaken Christian religion vied with war in the elimination of the best—at least as far as their influence on posterity through heredity was concerned. Any person of gentle nature, overflowing with altruism, of high intelligence, male or female, was sure to be appropriated by the church to its use. That meant, at that time, celibacy, and the absence of offspring. Viewed from the comparison of the celibates in the church today with the total population, this does not seem alarming; but in the Middle Ages conditions were different. For example, in the comparatively small population in Europe and around the Mediterranean, it is said that the Bene-

dictine order alone had not less than thirty-seven thousand monasteries, beside which there were monasteries of numerous other orders. This, however, was not all. The most fearless and the keenest thinkers, those who were the truth-seekers, the type of men who have brought fame and honor to modern science in recent years, were almost sure to antagonize the church and end their lives at the stake. Those whose attenuated morality and intelligence would permit them to subscribe to any creed, so long as such subscription would save their lives, were perfectly secure and lived to produce progeny; it was the intellectually alert and active who met an early death. While death at the stake is happily past, the Roman Catholic Church still withdraws a number of its ablest adherents from the ranks of parenthood, but does not curb the privilege among its adherents of lowest mentality. It is estimated that at the present time the Roman Catholic Church has one and one-half million persons vowed to celibacy.

Modern economic and industrial conditions might also be cited, in passing, as an influence toward celibacy. A vast number of young women in our times, who choose business or professional careers, are less inclined toward domestic life, if they are not thereby unfitted for it. Just as one example let us note that there are in this country nearly seven hun-

dred thousand female school teachers, many of whom will never marry.

2. While war is busy destroying our best stock, modern civilization with mistaken ideas of altruism, philanthropy, and sentimentalism is just as busy preserving our worst, and it is difficult to determine which is the more disastrous. Nature may seem to be ruthless, but after millions of years of experience she has learned wisdom. She has her own ways of punishing mistakes, and when she has decided that she has had enough of a certain individual or of a certain stock, if left to herself it does not take long for her to get rid of it. With her purposes and ideas modern philanthropy has interfered. Our primitive ancestors seem cruel to the sentimentalist of today in causing the death by exposure, or by other means, of unfit babies immediately after birth; but that kept the race strong. It is true that the unfitness which they observed would naturally be physical, but the very conditions of primitive society would tend to eliminate the feeble-minded and the insane when they existed. There was and could be no provision for their care, and wandering off by themselves and unable to care for themselves they met death from exposure and from wild beasts.

Today we care for our unfit of all kinds, care for them much better in many cases than we do for the fit who might add much to our civilization and to

our race. In our schools and colleges, three-quarters of a teacher's or a professor's time is devoted to the least intelligent one-tenth of the class. This is taken now as a matter of course. Parents who should expect that children brought into the world might have difficulty in getting along, do not now give it a thought, as they know that someone will care for, feed, and educate them. Parental responsibility is almost entirely lifted. This is no suggestion that the mentally unfit should not be cared for; the trouble is that in one particular they are not sufficiently cared for, and they are permitted to breed indiscriminately, and in some places and in some cases the increase of feeble-minded is noticeable. Take such an example as Nova Scotia, where the proportion of Nordic stock is greater than in any other place of equal size in America, and the scholastic records of whose students in United States universities show the high mental character of its natives. Practically nothing has been done for the segregation of the feeble-minded into institutions, except in the case of idiots and low-grade imbeciles; and families comparable to the Jukes and Kallikaks are to be found.

The feeble-minded can largely be eliminated in a generation when we really decide to do so, for heredity is the chief factor in the cause of this form of degeneracy. Whenever sterilization is proposed, there is the same kind of an outcry as is commonly

made by vivisectionists who allow maudlin sentiment to overcome reason. Marriage of feeble-minded is prohibited in some places, but this is not a deterrent, for illegitimacy is most common in such cases. Without disturbing the sentimental ideas of impractical idealists, the proper course is to segregate all feeble-minded, give them careful supervision, especially the women during the childbearing period, and the problem will become increasingly less. It is probable that entire elimination can never take place, for the ranks are always being recruited by accident, disease, and obscure causes; but modern science is contributing to further elimination of cases caused by disease, as is shown by the recent work with endocrine glands. This is well, and seems partially to neutralize the eugenic damage done by modern medicine in keeping alive numerous unfit individuals to become parents. Considerable work along this line has already been done, and there is no reason why this factor in mental degeneration should not be lessened as fast as science can show us the way.

Our defective laws are having somewhat the same effect as our philanthropic customs and institutions. Many of our criminals are mentally defective, and most of them are between twenty and thirty years of age. Not a few have police and prison records, yet, notwithstanding the fact that they are known as habitual criminals, they continue to go the

rounds of the police courts and jails, with liberty in between sentences for procreating their kind. Their very records show mental and moral defects, which justify continual detention, and such detention would prevent their leaving offspring to take their places as burdens on society.

3. There is only one way to produce brains and that is to breed them! We cannot develop them from non-brains, nor can we hope by process of education or training to increase potential mentality, which seems to be a fixed quantity; we must get brains from brainy parentage. Of course we have known this in a general way for a long time, but we dislike to admit it and to fashion our program upon it. We have been careful to breed animals upon this principle. There has been no improvement in the human race, during historic times, in any way comparable to that in domestic animals; yet there is every reason to think that an equally great improvement were possible, if selective breeding had been tried. If a Martian traveller should visit this planet and get a comprehensive view of our life, I can imagine the first observation he would make, with uplifted hands and horror-stricken face, would be, "You're breeding out your brains! you're breeding out your brains!"

What is meant by such a statement? Simply this: our brainy people are not producing sufficient children to take their places, while the mentally inferior

are producing far more than enough to fill their places—we are getting our population from the mentally inferior. If civilization is to endure, it will be necessary for the world to produce a fair proportion of individuals of such mental ability as to be able to assimilate our social inheritance—the culture transmitted to us by our ancestors—and further to develop and to improve it. A recent investigation shows that Harvard graduates average only seven-tenths of one son, and Vassar graduates one-half of a daughter. One thousand of the leading scientists in America will have only three hundred and fifty grandsons to marry. Let me take an example nearer home. The faculty of Colgate University numbers sixty. These men average eight-elevenths of a son and their wives average three-fifths of one daughter. I mention this not because it is extraordinary, but because it is typical. About four per cent of the young people of higher mentality are to be found in the student bodies of our colleges and universities; perhaps a smaller proportion of older people of high mentality will likely be found to be college graduates. It is not unlikely that the average number of children of the one hundred per cent of this class will not much, if any, exceed that of our college graduates and faculties. The tendency is for those who, by mental superiority, make a success of life, to send their children to college, and consequently practically all the off-

spring of superior mentality gravitate toward the colleges. If this condition of small families applied only to college graduates and not to others of high mentality, the result would eventually be the same. One advantage of a coeducational college, from the standpoint of eugenics, is that it serves as a matrimonial bureau for the mentally superior.

Brigham has analyzed the results of the army tests from the standpoint of racial groups as applied to immigration. He shows most conclusively that the immigration for the last thirty years has been of a distinctly lower mental quality, not only than that of former immigrants but than that of our average intelligence, and sounds a clear note of warning. It is from the recent immigration class that we are getting our large families and our future population, and thereby lowering our general level of intelligence. A similar condition is found in England. There, one-quarter of the population, and that quarter the poorest endowed mentally, is producing one-half the children, and statistics show that forty per cent of the population of England and Wales is defective in some way. If parents of low mentality did not have large families, though it might raise the general average of intelligence, it would not produce high intelligence. That can come only from the parents of high intelligence, and the responsibility still rests upon them—we can derive brains only from brains!

Our boys and girls graduate from college now at an average age of twenty-two; we must get them through at twenty. This can be done by our applying educational knowledge to rearrange our curricula, and not lose a bit of knowledge or training in the process. Our educational conservatism has prevented us from making changes which we know should be made. We can eliminate the eighth grade, which is principally a year of review; we can postpone our mathematics to a later period in our course, so that work which now requires a year can be done in a few weeks; we can start our languages when nature intended that they should be started and when she will help, instead of working against nature by starting in later years, and start with the spoken language as nature intended we should; we can adopt the metric system of notation instead of our present mess of tables which children find so difficult, and which many never can learn. The adoption of the metric system would also do away with common fractions in favor of decimals; nature provided us with the foundation of decimals when we were furnished with ten fingers. Simplified spelling might also help, if we should ever again pay any attention to spelling. There are two years saved already, and the boy is ready for college at sixteen, instead of at eighteen.

At present the average boy gets through college at twenty-two; if he is studying medicine, he gets

through medical school at twenty-six; then one or two years in a hospital—twenty-eight; then perhaps a specialty. He starts to practise at from twenty-eight to thirty, and it is three or four years before he is able to marry. That is, he marries at thirty-one to thirty-five years of age. The lawyer may be a little better off, but usually for the first five years of his practice his legal wit is used to discover means whereby the office furniture can be kept out of the hands of a long-suffering landlord.

Late marriages are the bane of the professional class and the peril of our race. It is obvious that a groom of thirty-five will probably have a bride of thirty or over. Both men and women of thirty and over are somewhat critical, and love does not loom so large in the program as financial considerations, social position, and personal comfort. Children are more in the way; habits are fixed at thirty, and it is practically impossible to have them rearranged to accommodate an unaccommodating baby. It is difficult for parents of thirty-five to train a child; and, more serious than that, it is extremely difficult for a baby to train thirty-five year old parents. It is easy to see that one child would be enough under such circumstances, and perhaps none at all would be more welcome. It was noted by some investigator, not long ago, that eminent men were the sons of old fathers. At first it was thought that the age of the father was

a determining factor in the ability of the son, but later it was found it simply meant that men of ability tended to marry late, and consequently could not have offspring until a comparatively late age.

Nature never intended people to marry at thirty-five. Marrying is romance—a great adventure—and neither romance nor adventure flourishes at thirty-five. The early twenties are Nature's maximum. Up to that time love does count, romance is in flower, adventure is the spice of life—we are all willing to take a chance, especially in matrimony. Then we do not demand financial or social position, and comfort is a secondary consideration. Certain colleges expel students who marry during their undergraduate courses, but it is not such marriages which are here being advocated.

These two years which we must save will not permit professional men and women to marry in their early twenties perhaps, but they will help and help a great deal. Many of our college graduates are now going into business. If the young man can start his business training and career at twenty, he should be able to marry at twenty-four or twenty-five. Many other college men are now adopting the profession of teaching; starting in at this work at twenty should enable the young man to marry even younger than the business man. Ministers have a better chance of marrying early than lawyers, for while their profes-

sional course is the same length, they more quickly receive an income on which they can support a wife, and there is frequently an empty parsonage inviting a bride.

President Roosevelt had much to say about "race suicide," and advocated large families. Race suicide is most likely to come by indiscriminately large families—large families among those who should not have them, and small families among the mentally fit. If President Roosevelt were living today I believe he would sound a clarion call to the professional classes and college graduates—indeed his message was then intended for such—to produce their kind and save the nation. It seems altogether unlikely that this nation will be able to fulfil the high destiny toward which it is to be directed unless we produce the brains necessary to accomplish the task.

There are certain denominations (or one at least) which have always advocated large families. The unproclaimed theory was that the way to increase the size of the particular denomination was to increase the size of the families of the denomination. Undoubtedly this teaching has had an effect. What is the condition now? It is that large families are the rule among those of low mentality, but the parishioners of higher mentality have defied the church and limited the number in their families. Modern science should teach the denomination as well as the nation

that no gain can come, except in numbers and subserviency, from the present methods, and that a new doctrine must be preached—that of limiting the families of the mentally inferior and encouraging in every way possible the size of the families of the mentally superior.

If Pearl's calculations are correct, that the maximum population of the United States will be 197,000,000, which will be reached in 2100, it behooves us to be careful. The children of today will decide the quality of these few generations of the next century and three-quarters, and it should be realized that at the present rate of increase (or decrease) twenty Harvard graduates of today will have only one descendant at that time.

CHAPTER X

ARE WE IN DANGER OF INTELLECTUAL DECLINE? (Continued)

4. Henry Fairfield Osborn has made a statement which challenges our attention even in a day when startling statements are being continually made: "If I were asked: What is the greatest danger which threatens the American Republic today? I would certainly reply: The gradual dying out among our people of those hereditary traits through which the principles of our religious, political, and social foundations were laid down, and their invidious replacement by traits of less noble character." He sees as with the eye of a prophet, but really by means of scientific deduction, the gradual replacing of the original American stock with a combination of the other races of the world and the various branches of the white race, until the great ideals and hopes with which this nation was started have been changed to give way to ideals of other and lower races, as the blood of the black, brown, yellow, and red races are mixed with the white race where the Eastern and Southern Europeans predominate, and the resultant is a combination of the lowest qualities of each. He is looking forward to the time when the melting-pot will have done its perfect work.

Certain studies which have recently been completed, although of a somewhat varied nature, converge on the subject of our racial character and prospect, and unfold to us some serious problems of which we have formerly been in innocent ignorance. But now the handwriting is so plainly etched upon our walls that to ignore the warning would condemn us as not only mildly indifferent but as criminally negligent, for if signs can be read aright we are rushing madly on to race suicide and extinction, so far as this continent is concerned. With our race will inevitably go our civilization. Of course there are many who refuse to be alarmed and sit calmly by, even as they did in the decadence of Egypt, Greece, and Rome, not comprehending and apparently not caring what fate awaits their race and their nation.

Madison Grant says: "Democratic ideals among our homogeneous population of Nordic blood, as in England or America, is one thing, but it is quite another for the white man to share his blood with or trust his ideals to brown, yellow, black, or red men. This is suicide, pure and simple, and the first victim of this amazing folly will be the white man himself."

It is a matter of note that the Japanese are increasing very rapidly on our western coast, that Indian blood is not becoming extinct but is mixing with both negroes and whites, and that the negroes are becoming increasingly lighter in color. Probably there is not

a pure blooded negro in America, and the number of mulattoes increased from one hundred and twenty-six per thousand in 1850 to two hundred and eighty-four per thousand in 1910. The census of 1920 showed a decreased percentage of mulattoes, due, it is supposed, to the fact that negro enumerators were used in 1910, and white enumerators in 1920. The negroes form ten per cent of our population and are moving north and west where the mixture with the whites is much more rapid than in the South. These facts should make us think, but my emphasis is not on the other races, but on the danger which the "melting-pot" brings to the nation on account of the breeding out of the higher divisions of the white race and the breeding in of the lower divisions.

The original settlers of what is now the United States were Nordics of the best class, and the early immigrants into the country down to 1850 were also Nordic. The Germans and Irish who came from 1850 to 1890 had a smaller proportion of Nordic blood than the earliest settlers, but were still sufficiently infused with it to prevent the stock from deteriorating. From 1890 to the present the great proportion of immigrants have been Alpines and the descendants of Roman slaves who are to be found in the south of Italy, the progenitors of whom were gathered from various sources around the Mediterranean, and from the nature of the case were of inferior stock. In addi-

tion to these were some Mediterraneans and a few Nordics. The great fallacy of the "melting-pot" was that we thought environment played a much larger part in life than heredity, and if we could only get people here and surround them with proper environment,—it mattered not who they were,—they would become intellectual, cultured, and moral according to our standard. Experience has proved the falsity of such a supposition. What this practice of "democracy," "equality," and the "melting-pot," has accomplished is to permit persons of different races and intellectuality to intermarry and to deteriorate our stock at an alarming rate.

The biologist Humphrey says: "Our 'melting-pot' could not give us in a thousand years what enthusiasts expect of it—a *fusing* of all our various racial elements into a new type which shall be true American. It *will* give us for many generations a perplexing diversity in ancestry, and since our successors must reach back into their ancestry for characteristics, this diversity will increase the uncertainty of their inheritance. They will inherit no stable, blended character, because there is no such thing. They will inherit from a mixture of unlike characteristics contributed by unlike peoples, and in their inheritance they will have certain of these characteristics in full identity, while certain others they will not have at all."

In our thinking we are optimistic; we think of a mixture of races as raising the lower race rather than as lowering the higher race, and at least as striking a mean between the two. Biologists see the matter differently. The offspring of a mixture of races tends to revert to the ancient and lower type. The characteristics of the highest races are recent developments and, as the last factors in development, are consequently unstable, and they are the first to disappear. A cross between a white and a negro is always a negro and never a white. The brunette, which is the lower characteristic, is always dominant in a cross. There is always a tendency to lower the average in mixing races, but to this there are many striking exceptions. The various breeds of dogs if allowed to interbreed would soon revert to a wolflike animal of a uniform type, like the former dogs of Constantinople. Darwin noted that cross mating seemed to evoke the original characteristics which had been latent but suppressed in the pure stock of the parents. "Never in the history of the world," says Gould, "has a mongrel people ever attained real prosperity." The melting-pot was supposed to produce a people retaining the best qualities of a miscellaneous ancestry; unfortunately it does not work that way—the tendency is in the opposite direction.

History has shown us that when two races of different mentality have lived in intimate contact, the

lower always tends to crowd out the higher. The crowding is not by shoving aside so as to force the higher to go elsewhere, but the children of the lower take the place of the unborn children of the higher. The people of the higher race refuse to have their children in competition with those of the lower, especially as laborers, and only bring as many into the world as they can fit to take positions superior to the children of the lower race. In Rome the lowest of the six classes into which the population was divided was called what? Proletarian, that is, producers of offspring—not good for anything else and chosen as stock from which to breed. Is it any wonder Rome fell? In Massachusetts the birth-rate among foreign-born women is two and one-half times that among native-born, and of the former, Poles, Polish and Russian Jews, South Italians, and French Canadians are the most prolific—some of the lowest immigrants we get. In 1920, in the United States as a whole, of the mothers who bore children in that year the Polish and Italian had an average of 4.5 children, the German 4.4, the Austrian 4.3, the Hungarian 4.2, and the native United States white 3.0. One thousand Harvard graduates in two hundred years will have fifty descendants, while one thousand Roumanians will have one hundred thousand, at the present rate of increase.

In days gone by when European civilizations were

threatened, there were hordes, usually strong Nordic hordes from Northern Europe, on the borders, led by adventurous kings or generals, ready to come in and assume the burden. But today there is no hope of that. We must either build up from our own resources and conserve our race power, or else we must admit only such immigrants as shall strengthen and not weaken our race, or both. One thing, however, must be basic—we must be deluded no longer by figures of speech like "equality" and "the melting-pot." The iron law of nature, which cannot be changed, is the law of inequality; and the "melting-pot" is destructive to our race. If we are to keep up our stock we must select our breeders. Immigration is the keynote of the solution of our problem; whether or not the original Nordic stock in our population will retain its present proportion depends upon the mentality of the rest of our stock. The truth is that recent immigrants, on account of the ease of transportation and the desire to escape military service, are in deep contrast to the adventurers of former days. While we have for years guessed something concerning the mentality of the different racial groups, the mental tests made during the war have given us a standard of measurement, which all criticism has failed to discredit. Brigham's *A Study of American Intelligence,* founded on these tests, is very illuminating. Taking first the three great divisions of the white race, he found the men-

tality averages on the combined scale to be: Nordic 13.28, Alpines 11.67, Mediterranean 11.43; and all methods of testing give the same result, which is in accord with other investigators and authorities on the subject. In the net immigration from 1908-1912, Alpines formed fifty per cent, Nordics twenty-three per cent, and Mediterraneans twenty per cent. Immigrants from certain countries in order of intelligence, compared with the native United States population, are as follows: England (14.87), Scotland (14.34), Holland (14.32), Germany (13.88), United States white (13.77), Denmark (13.69), Canada (13.66), Sweden (13.30), Norway (12.98), Belgium (12.79), Ireland (12.32), Austria (12.27), Turkey (12.02), Greece (11.90), Russia (11.34), Italy (11.01), Poland (10.74), United States colored (10.70). The figures are those of the combined scale, being little different from the mental age; the order is the same. There are no data by which the intelligence levels of the different races which stay in their native countries can be compared. The available data are for emigrants only, and they are a selected class. They are not the lowest, for the feeble-minded are not supposed to be permitted to enter the United States, nor are they probably the highest intellectual class. At least they show some initiative. While nationalities, *in toto,* cannot be justly compared from this data,

but only their emigrants, so far as the problem for the United States is concerned the result is the same.

The conclusion of the study is based upon our latest scientific data. The average intelligence of our immigrants is declining. At the time of the passing of the Quota Act of 1921, seventy to seventy-five per cent of the total immigration was Alpine or Mediterranean. About three hundred and fifty out of every one thousand of the Alpine and Mediterranean types are below the average negro. The proportions admissible under the Quota Act of 1921 were 35 per cent Nordic, 65 per cent Alpine and Mediterranean. Since 1901, almost ten million Alpine and Mediterranean types have come here and, allowing for returns, would give us two million immigrants below the average negro. If in America we look forward to the intermingling of all the types, including the negro, a prospect which seems most likely, the outlook for intelligence is not encouraging. The 1920 census shows seven million of mixed native and foreign parentage.

So far we have been dealing with the averages of different groups of people, and if the selection is to be by groups this is well and good. Probably the more fair and more valuable discrimination would be by individual valuation. No one would contend that all Poles are very little higher in intelligence than the average negro, or that all Englishmen are su-

perior to all individuals of other nationalities; in truth, we find wide variations of intelligence in every group. Occasionally we find a pure-bred negro direct from Africa, where there was no possibility of the admixture of other blood in his veins, of high intelligence. The Maori children, of New Zealand, have shown ability in the schools of the dominion, some of the pupils doing as well as some of the white children; American college classes not infrequently contain one member of a supposedly inferior race, who is carrying his work well.

But we have recently had evidence from another source, in an approach to the problem from another angle. The statement of Dr. H. H. Laughlin before the Committee on Immigration and Naturalization of the House of Representatives is enlightening. In regard to feeble-mindedness, against which our laws are so stringent, it is found that in institutions for the care of the feeble-minded, thirty-one per cent in proportion to the population are immigrants, when if the law had been enforced it would be zero; native white children, with one parent foreign, exceed their proportion by ninety per cent, and native white children, with both parents foreign, exceed their proportion seventy-five per cent. That is, even when the immigrants are not defective they carry the taint. In insanity the foreign-born exceed their proportion ninety-three per cent. In all types of social inade-

quacy the foreign-born exceed their proportion by forty per cent. In conversation recently, a man who has had wide and successful experience as the superintendent of an institution for abnormal persons said that when he began his work, perhaps thirty years ago, he received many tall, light-haired cases of dementia, but now he gets a much larger proportion of cases of small, dark-haired amentia. These social inadequates cost the people of the United States one hundred million dollars annually, beside economic and social drag and racial degeneration. While it is true that we do not know all about the science of race betterment, we do know enough to make a sure start. We know the cost of caring for the socially inadequate, and we know that "a single genius is worth more than a dozen gold mines." Putting it on the lowest basis, that of finance, it pays to breed from the best and to eliminate the weak. Mentality is the only real wealth. A nation's strength is tested, not by numbers, but by the proportion of people of ability which it contains. Darwin said: "It is very difficult to say why one civilized nation rises, becomes more powerful, and spreads more widely than another; or why the same nation progresses more quickly at one time than at another. We can only say that it depends on an increase in the actual number of the population, on the number of the men endowed with high intellectual and moral faculties, as well as on their

standard of excellence. Corporeal structure appears to have little influence, except so far as the vigor of body leads to vigor of mind." Louis Pasteur was but one of millions of Frenchmen, yet, as Huxley points out, his mind sufficed to pay the total indemnity demanded as a result of the Franco-Prussian war. He was worth a host of ordinary soldiers. The intellectual supremacy of Athens was due to the good stock of its inhabitants and to the high grade of immigration attracted there. The whole advancement of the world has depended upon the ability of a comparatively few great minds, and these can be obtained only by breeding them. Many intellectual families and notable mutations have been lost to the human race because it was not thought necessary to conserve them. There have been, however, some outstanding examples of selective breeding. The father of Simon Newcomb, the noted mathematician and astronomer, is said to have hunted through the whole province of Nova Scotia, a land where good stock is not rare, looking for a suitable wife. Gould says, "A pint can never be educated to hold more than a pint." It may be put in an environment where it will be more useful, but never will it develop more capacity. Mental superiority is much more recent than physical and much more unstable; high intelligence is a recent trait and is comparatively rare. We have spent more effort to keep the race stupid than to make it intelli-

gent, and now we are dissipating what intelligence we have.

The fall of Rome and the Civil War in this country do not seem to have taught us much, for we still believe in importing slaves. Of course we do not call them by that name, but it means a demand for cheap labor which shall do our bidding in a docile manner, regardless of what effect it shall have on our race future. The ten million negroes in this country look us in the face in vain. Gould says: "Our importation of multitudes of ignorant and utterly alien laborers will, among other calamities to our body politic, degrade it. But while we should be warned in time and take proper measures to control this evil, and do so instantly, our position is still strong, for there are yet left in America fifty million people the greater part of whom can trace their ancestry to Colonial days before pollution began, and it behooves us to disregard every temptation, whether it be the threadbare plea of the need for cheap labor to develop our great resources, or the equally threadbare sentimentality which urges us to destroy ourselves under the specious and false assurance that out of mongrelism will arise perhaps some thousands of years hence a better strain. The labor thus imported will prove the most expensive ever employed, for we shall pay its wages in our race life's blood. The promised elevation or uplift of the world shall merely result in our own

degradation, for we will open Pandora's box and when its untold evils have rushed out and become wide-spread, happy indeed shall we be if, like Pandora, we have still left with us hope."

The recent immigration bill has helped the matter, but it has not entirely cured it. According to the Quota Act of 1921, amended in 1922, there were to be admitted three per cent of the natives of any country residing in the United States, according to the census of 1910. The Selective Immigration Act of 1924 reduced the percentage from three to two, plus one hundred, from each country, the determining census to be, not that of 1910 but that of 1890. This means not only a decreasing immigration but a far greater proportion of Northern European immigrants and a far smaller proportion of Southern Europeans. If illicit immigration can be prevented, this should produce a vast improvement over any previous condition. The act itself, founded on the latest results of scientific investigation, is worthy of all praise.

No better example of what has happened can be found than in comparison of New England of today with the New England of fifty to seventy-five years ago. Undoubtedly we must have work accomplished if industry is to be continued, but Nordic brains will not only invent machines to do the work, but will run the machines after they are built. As machines took the place of black slave labor, so they must take

the place of modern slave labor. These words come from one who has little sympathy with the conduct of certain labor unions, and yet to solve the problem by destroying our race through unwise importations of low grade labor is too great a price to pay for a temporary solution.

5. A danger which is as yet indefinite, but is looming up in a menacing way is that we are loading the machine heavier than the power can stand. We have too many tools and not enough steam. To repeat the language already used, our social inheritance is increasing so rapidly and our biological inheritance so slowly that the former is making too great demands upon the latter. The complexity and demands of modern civilization are rapidly becoming too much for our brain power. If we compare the complexity of modern life, with its forced speed and insistent tasks, with the life of the Greeks, and then consider that all this must be accomplished with the same intellectual ability, we can better understand what the strain must be. In the matter of education we have advanced (I trust it is advancement) far beyond the three Rs, and the confusing multiplicity of subjects in our high schools and colleges is a constant matter for criticism.

If a telephone exchange has one hundred lines connected with it, and one more be added, the resulting addition to the possible combination of calls is more

than two one-hundredths, not one one-hundredth. So every new discovery, every new invention, every new device does not add simply one more, but a vastly greater complexity and confusion. When the internal combustion engine was discovered we greeted it merely as one more invention; but among other things resulting from it is the automobile, and there is practically not a thing connected with modern civilization which the automobile does not affect. In thirty years it has revolutionized the world. The printing press, the moving picture, the radio, and numerous other additions to our civilization are each giving the old world a turn until we are literally in a whirl. We have welcomed every new discovery and have hoped that we might live sufficiently long to see many more; but with the rapidity with which they are coming, how long can we endure?

In the forty years between 1880 and 1920, the population of the United States increased one hundred and eleven per cent, but the number of persons in our insane asylums increased four hundred and sixty-nine per cent. According to available statistics there were, in 1890, one hundred and seventy cases of insanity to every ten thousand of the population, two hundred and four in 1910, and two hundred and twenty in 1920. The record was even more discouraging in New York State, where, in 1920, there were three hundred and seventy-four insane to every

ten thousand of the population. These figures do not include epileptics or feeble-minded, but if these were included these numbers would have to be increased threefold. Allowing for greater efficiency in diagnosis, it is estimated that our insane population has more than doubled in forty years, and that at a time when curative methods for mental diseases have been more successfully applied than at any previous time in history.

We speak of today as the day of specialists, and why? Because the human mind cannot grasp a whole subject; it has not the power and can only touch the fringes of one side of it. Will the time not come when we shall be unable to adjust ourselves to the things necessary for life, and when even a specialization will not be sufficient to meet our needs? Wagner's call to the simple life made an appeal for a few days, but was eclipsed by the next sensation. With frazzled nerves, sensations must increase to give the same effect, and by a pathological circle the increased sensation tires out wearied nerves even more. The insanity, referred to above, which shows itself in the second generation of our immigrants, though not apparent in their fathers when they arrived, is evidently due to a strain which the mind could not bear. In the increased demand for psychiatrists, it appears that more careful diagnosis does not account for the need. Given enough time, the mind would undoubtedly ad-

just itself to new conditions, but with the bewildering rapidity of the change of mental environment, the danger is that the mind cannot adjust itself in time.

6. The last danger to which I wish to call attention is one emphasized by Patrick. It is that the comfort and ease and time-saving devices of our modern life will result in degeneracy. The race rose to its present high status through struggle and strife. This is also the golden road to success for the individual. In the discussion of the theory of recapitulation it was pointed out that the individual must copy the race in the strenuous muscular work of early years in order to be in a position where the mind can develop properly when adolescence comes. Except to say that the race has so developed, we do not know why there is such an intimate relation between the development of the muscular system and the mental development.

The modern demands upon the mind have just been alluded to; in connection with this we should recognize the decreasing demands upon the muscles. With the overwhelming avalanche of automobiles which meets one at every turn, people are in danger of losing the use of their legs. Students in high schools and colleges must have cars to enable them to go to classes, business and professional men must be driven to their offices where they sit in comfortable chairs all day; women as well as men are addicted to lack of muscular work. Every conceivable form of labor-

saving device attracts the flabby moderner, and time-saving devices are constantly employed in order that we may have more time to take our ease.

"A strong race is a resistant, not a protected race." The great victories of modern science have been those largely of protection rather than of resistance, which means eventually that the race is being weakened. The process of resistance is fatal to the weak for it means their elimination, but it is nature's method. For example, the negro race is resistant when exposed to malaria, but to obtain this privilege it has meant at some time the elimination of all members of the race susceptible to the germ. The white race, never having gone through this process, has to be protected. Nature's method of immunity to certain so-called children's diseases is to strengthen the system so as to resist the disease germs in the future. It seems that it might be possible to strengthen the constitutional resistance of the race against all diseases, but it would mean the sacrifice of a multitude of individuals who are now craving protection. Pearson has shown that the death rate from tuberculosis was falling more rapidly before the campaign was begun against it than it has since. In 1911 he predicted that the death rate would again rise, notwithstanding the preventive measures in use, and in 1918 this took place in England. The preventive measures have saved some lives, but have weakened the racial resistance by keeping

alive and breeding from susceptible people. The future generations will probably have to pay the price.

Developed muscles will not only help to resist physical diseases, but this very condition of resistance will help men mentally. There is also, however, a mental resistance as well as a physical, and this is necessary to make us strong mentally. James's advice in his famous chapter on Habit is right to the point. He said: "Keep the faculty of effort alive in you by a little gratuitous exercise every day. That is, be systematically ascetic or heroic in little unnecessary points, do every day or two something for no other reason than that you would rather not do it, so that when the hour of dire need draws nigh, it may find you not unnerved and untrained to stand the test."

The life of physical ease is not conducive to mental strenuousness, and as the modern man is finding substitutes for walking, he is also looking for substitutes for thought. Less and less are his mental recreations in the form of physical strenuousness. Less and less do men wish to be alone in order to think. They seem to be afraid to be alone. In order to be happy we must either curb our desires or satisfy them—how few strive for the former! Few young people are permanently at a disadvantage on account of lack of money—this apparent disadvantage becomes in the training an advantage. Yet we see the modern man making every effort to accumulate money, not only for his

own ease, but in order that his children may be at a disadvantage thereby. The whole matter is moral in its essence, for, as has already been pointed out, the moral is the first to go in any retrogression, and if we are to hold our position in civilization this moral advantage must be retained. In our strife for advancement we must endeavor to make men better rather than more comfortable, we must harden rather than soften them, we must develop their resistance rather than throw around them new privileges, we must exercise their powers rather than try to save them. Work, struggle, effort—these are the elements of progress; ease is the first symptom of decay. We have no better example of racial degeneration than the tapeworm—all hooks and mouth, and capable of using only predigested food. Is the tendency of modern civilization toward this state? In a previous chapter we have indicated the effect of leisure upon Rome; does that mean anything to us, or does history warn us in vain?

CHAPTER XI

WHAT FUTURE CHANGES MAY WE EXPECT?

WHEN we talk of the future of mentality we usually refer to knowledge rather than to power, and try to prognosticate or to imagine the things we shall know in a thousand or ten thousand years. Rarely do we speculate concerning the change in mental ability. We have some guide from the wonderful development of social inheritance during historic times, but the entire lack of development of biological inheritance in the same time provides little as a basis for prophecy. It is in social inheritance that acquired characteristics are transmitted, not in biological inheritance, and that makes prognostication concerning the latter more difficult. Yet it is on account of the social inheritance that we can guide biological evolution, and by this means have "self-conscious evolution." To use another of Hobhouse's phrases, we must insist upon "aristogenic evolution." When we do come to the place and time when we breed from the best, then the science of eugenics will have become established.

Let us lay aside for the moment the subject of physical evolution in our discussion of "the best," and ask what is the best from which we shall breed, and for which we shall aim. Let us suppose that we

choose those who show the highest potential mentality according to their grades in the present or future developed intelligence tests as the parents of the future race, would that insure us the results which a self-conscious evolution should try to develop? Just here is where we should have to be most careful and call to our aid the most skilful investigation and scientific reasoning of which we are capable. We may be sure of the opposite thesis; namely, that we should eliminate as parents those who make the lowest grades in such a test, and I think we should come to the conclusion that we should accept those who make the highest grades, provided certain other tests which we already have or should devise could also be successfully passed.

There are at least two dangers in specialization, one of which has already been noted, and to which reference will later be made. It has been noted by breeders of highly specialized animals, such as highly and finely bred cattle, that they are more susceptible to disease than the mongrel or grade animals, and that as a rule they cannot endure rough usage or lack of care as their more humble fellows can. We have noted that the more finely organized and highly developed people mentally are more unstable and more susceptible to mental disorganization than others. The probability then would be, if we bred for pure intellectuality without considering other mental

qualities, that we should develop an unstable race abounding more or less in genius. In some tests of mental balance which have recently been made, it was found that the most intelligent tended to have the most symptoms of emotional instability and lack of balance. While these tests have not been given to enough persons to establish any general law, they seemed to indicate an inverse relationship between intelligence and balance.

In our discussion of instinct we saw how those animals which took advantage of an early specialization in instinct, sacrificed a future higher development for the present aid which instinct furnished, and that the less highly specialized and more generally developed species finally developed more intelligence to aid in adjustment, and won out in the contest of life. But is the contest finally settled? Might we not find that to specialize in intelligence would be to sidetrack future development of another kind and hence to lose out in the end? Are we not losing the lesson which instinct has taught us and neglecting the warning of the danger in specialization?

If we should breed for intelligence only, and eliminate all members of the species who did not measure up to the highest tests of potential mentality, might we not cut off all possibility of a development in the race of some mental quality higher than intelligence? But can there be anything higher than intelligence?

At one time in the history of the world we can imagine a question, "Could there be anything higher than instinct? if so, what?" and no answer could then be given. May we not be in the same position now when we are asked, "What could be higher than intelligence?" If there is such a thing let us recognize that and breed it.

Genius is not pure intellectuality, perhaps not chiefly that. It is difficult to define and more difficult to analyze. It exhibits itself in different forms in different persons. The person whom we think of as a genius is not one who simply sits down and reasons things out in a purely intellectual way. We hardly think of the expert reasoner as a genius. The genius, whom we think of as belonging to a higher order than that of the ordinary intelligent individual, is one who gets the answers without reasoning. I know that in reasoning we frequently get the answer, and then form the syllogism later, but that is not what is meant. The secret of genius seems to be in a particularly active, nimble, reliable, and productive subconscious activity. In some cases it seems as if the threshold of consciousness is lowered in the genius, and the activities which in ordinary people are unconscious or subconscious are in him a definite part of consciousness. At any rate this subconscious activity is more rapid, sometimes more accurate, and accomplished with far less fatigue than the conscious

activity, even when the same result is achieved; but it is not infrequently capable of doing work and of solving problems which the conscious activity has already failed in or has not thought possible. Its work may be unique. What we call "intuition" is another example of the result of similar processes. The question naturally comes to one, Is this not a hint of a future development which would lead the race higher than pure intellectuality?

In hypnotism we frequently have exhibited a hypersensibility. The activity of all the senses is heightened, and the subject is sometimes able to accomplish extraordinary feats of this character. One author opined that a hypnotized person could read the common print of a book by its reflection in the eye of an operator who was holding the open book with its back to the hypnotized subject. So minute would such a reflection be that this would undoubtedly be an impossibility, but it goes to show the extent of the exaggeration of sensibility which some experimenters think possible. We do know that hypnotized persons can hear, see, and feel in a way which is not possible for them in their normal condition. Can this hypersensibility be developed in normal personalities, and if so is this power worth cultivating?

It is recognized that keen sensibility is not so valuable for the advancement and preservation of the

species as it was in primitive times, for then life itself depended upon the sensitive nose, the sharp eye, and the keen ear. Until the advent of the automobile age the advantage in the struggle for existence depended less and less upon those activities so valuable to primitive man. Now, as he attempts to cross Fifth Avenue his life depends upon his quick eye, his keen ear, his rapid reaction time, and his nimble leg. A sympathetic thought cancels thousands of years, and makes his primitive ancestor a true brother in distress. It is altogether likely that the sight and hearing of the modern man are as keen as those of the early members of his race, at least they are equal to those of the primitive races existing today. With his finely developed hand, modern man is not below primitive races in active touch. The one sense which seems to have degenerated is that of smell; what we call taste has also become less keen, but that is largely smell and has deteriorated as smell has. The large broad nose, so characteristic of primitive types, has atrophied with disuse, and with the lessening of the physical organ has gone also much of the special sense. We not infrequently meet those who have an atavistic sense of smell, who are able to identify articles belonging to different persons by smell. The blind often have this sense abnormally developed.

While the ancestor of man was yet on all fours, this was his most valuable sense; but when he as-

cended to the trees and later when he stood on his hind legs, sight took the place of smell, and the latter decreased through disuse. Smell is now more or less a vestigial sense and the modern man may be better off without it, except in so far as it contributes with pressure and temperature to the experience of taste. If hypersensibility could be developed, it is most likely that the quickening of the senses of sight and hearing would be most valuable, and that not only on account of what it would mean in itself, but on account of the stimulus it would give to quicken mental reactions. Is not this a possibility for the future development of the race?

Then there seems to be another hint in telepathy. Speech has been of wonderful advantage to the human race, and has made our social inheritance possible; but is there a danger that we are being sidetracked, and prevented from developing a higher means of communication on account of specializing in speech? Even if our verdict concerning telepathy is the Scotch one of "not proven," there is evidently a mass of facts looking toward telepathy which our ordinary methods of explanation fail to unravel for us. Rivers describes how Malaisians carried out some collective work without previous arrangements and without using spoken words or signs. May there not be in this another hint of a future development

toward which the race is tending, and which a breeding for pure intellectuality would abort?

It might be questioned by some if in suggesting the developing of some factors connected with genius, hypnotism, and telepathy we are not taking a backward rather than a forward step. Do not these subconscious elements belong to a primitive rather than to a developed life? Should we not emphasize the intellectual rather than the subconscious factors? Several things may be said in answer to this question: in the first place, we have only recently come to realize how large a part of our present mental life is subconscious in its action, and how important this part is. The illustration of the iceberg is sometimes used in this connection, because of the fact that two-thirds of its mass is under the surface, as the larger part of mental life is subconscious. The subconscious action is sometimes more reliable than the conscious, reasoned conclusions. In the second place, it seems as if some of this activity which is now subconscious and only appears occasionally in genius or telepathy has been sidetracked by the specialization of intelligence. If this is so, the breeding for and use of these elements may well restore a better balanced and more efficient mentality. After all, what we are to decide is not what is primitive and what is modern, but what will be most valuable in the future development of the race, since it seems as if the elevation of some of

these subconscious factors to the conscious plane might be of great value to future generations.

There naturally come to mind various investigations and discoveries now being made in the realm of what used to be known as abnormal psychology, but which we now know to be very normal psychology. Has not psychoanalysis, stripped of its theories and confined to the results of investigation along this line, a few hints for us? Should mental hygiene simply be concerned with the elimination of traits and tendencies which seem to be detrimental to efficient mental work? Should it not also be leading us into the realms where the mind shall not only be not deteriorated, but where it shall be improved—should not the direction of mental evolution be a distinct and the most important part of mental hygiene? It will be noticed that we are chiefly concerned now with asking questions—some questions containing perhaps some suggestions; but what further can we do until we organize all our resources in the attempt to solve this question of mental evolution, undoubtedly the most important question which is clamoring for solution today—a question which must be perpetual through the ages.

If there is to be further evolution it is interesting for us to speculate as to the exact form which it will take. Most of the attention paid to the subject has been from the physical standpoint, and our descrip-

tion of it and attention to it have been almost wholly physical. Changes in physical structure have been necessitated by adjustment to the environment. This is not so necessary now. In prehuman times it was necessary, if life were to continue, and this was true even in primitive times, when the low form of intelligence sought to accomplish the same thing. As mental power developed there was a change of attitude, and now it is the environment which the human mind adjusts to its needs. Very early the adjustment of the organism was wholly physical; later the necessity for this ceased, and it became mental. As far as necessity for accommodating the individual or the race to environment is concerned, physical evolution may well have ceased, and we do not look for great physical changes in the future. There may be some symptoms to indicate that we shall finally be relieved of certain undesirable members which we hope may atrophy through disuse—such as the vermiform appendix; there are also some indications that we are gradually losing some of our lesser toes, and that we may follow the lead of the horse and become a one-toed species. If this happens we shall probably not be any more inconvenienced than is the horse, and these changes will not be striking enough to make much difference. The muscles of the foot which formerly turned the toes, the now useless muscles of the ear, and certain other inherited but now superfluous

organs may follow in the same way, to the advantage of the body as a whole.

There are some persons who are willing to state their belief that not only has physical evolution ceased, but that individual mental evolution has ceased as well. The arguments used to sustain this opinion are not so conclusive. With the rapidly changing environment, and the necessity of accommodating ourselves to new mental conditions, as well as the endeavor to accommodate new mental conditions to us, we still need individual mental development. The fact that we have seen little evidence of such development in historic times is no argument against its now taking place as rapidly as it ever did, which would not be sufficiently rapid to show in this comparatively short space of time. We know that individual mental evolution has taken place through the ages; it is still needed, and consequently there is not the same likelihood of a suspension of evolution in this form as in the physical.

If, however, individual mental evolution is finished, in what form will evolution show itself? In social evolution, say Conklin and others. They opine that the race can no longer improve through an individualistic society and that all hope of improvement, and hence of evolution, must come about through the organization of the individuals. It would mean eventually something similar to an ant or bee colony,

founded not on instinct as in the case of these insects, but on intellect. The fact to which attention has already been called, that the moral and religious are the highest and latest phases of evolution, proving their high place by their instability, lends some color to this theory. Moral and religious elements in our personalities deal with the relation of persons to each other and are consequently social.

The arguments for the antithesis between the two forms of evolution are far from conclusive, and it seems reasonable to suppose that the two should progress concurrently. For the highest social evolution we should need the highest individual development,—the former does not take the place of the latter as the mental does of the physical in the matter of adjustment. To the contrary, it seems that only as we have the highest continued individual development can we have a progressive social development. Those who claim to see the beginnings of a social evolution in our present experience, cannot be sure that if social development should be the next evolutionary stage it will progress along the lines upon which it has started; if it should progress along other lines it may need even more than now a more highly developed individual mentality.

There is another contingency. Should individual mental development follow some line such as we have suggested as a possibility, it may be that if social de-

velopment has already started it would not be appropriate to the new mental conditions and that it would consequently be a blind alley. In fact, such a social organization as the new development presupposes might hinder rather than help a higher individual evolution. Or, on the other hand, if the suggested individual development, or some other form of development higher than the intellectual, should eventually come about, might it not also demand an entirely different sequel than the social? The whole matter is purely speculative, especially as we have not the requisite data to form the basis for well-grounded conclusions.

It is not likely that animals of higher intellectual attainments than men ever existed, or ever will exist. The probability is that the highest intellectual development will come through man, though there is a possibility that if we specialize too much on pure intellectuality, there may come up some line of development for creatures now considered our inferiors, which will be superior to intelligence in adaptability, and mental evolution may sidetrack man and honor some other species which has so far had a more general but less intellectual career. This does not seem likely, however, for when we look at our tasks and consider our possibilities it appears that intellectual development may be but at its beginning instead of approaching its culmination. The basis for this opin-

ion may be the same as that for immortality—a hope rather than a reasoned argument; we all feel as did Cecil Rhodes on his deathbed, "So much to do, so little done." We look forward, either in the future of the individual after death or in the future of the race, to conditions which will permit us to do the things, the mere outlines of which we see dimly, and yet which are continually beckoning to us and leading us on. If these things are to be accomplished, it can only be by a race with higher intelligence than our average, with some individuals higher than our present highest. At least so it seems to us now; a few generations ago our ancestors might have thought that a superior mentality would be required of a people who would fly through the air on the wings of the wind, who would dive under the sea with death-dealing vessels, who would talk to each other across continents without visible means, and whose vision would penetrate wood and stone.

In addition to this hope we have the very reasonable method upon which to rely of judging the future by the past,—and the past has certainly shown us a steady, if slow, evolution pointing to different things, and the highest of these different things has been saved by the reason of its very efficiency. Kellogg thinks that the path which evolution will take has already been determined and indicated, and that it must hold to the direction of intellect. The particular

reason for this is that intellect prescribed the perfect means of adaptation of the organisms to environment, or better, adaptation of environment to the organisms, which guarantees the permanence of this specialization. Perhaps so, but could not the same thing have been said about instinct before the fuller development of intelligence put the ancestors of man above the insects? The efficiency of instinct saved it, the greater efficiency of intelligence saved it; shall we look forward to some new and as yet not fully developed form of mentality to take a higher place than either or both of these? There is no reason for our thinking that the forces which have brought us to our present position are now exhausted. We must not be fettered by the limitations of our imagination; if we had seen the world at one time could we have prophesied life? If we had seen it shortly after the beginning of life could we have imagined man? Ruskin has well said, "There is as yet no ascertained limit to the nobleness of person and mind which the human creature may attain, by persevering observance of the laws of God respecting its birth and training."

If, as seems most likely, the intelligence of man shall develop far in excess of its present lofty position, eugenics, in the form of self-conscious evolution, will have to lead the way. It is inevitably the most important science, for all other sciences depend upon

it. The best minds of the race should be concentrated upon it. With greatest care we must choose the most desirable stock, and insist upon breeding from that, and that only. It must be stock of such a character that it contains physical characteristics which best fit it for standing the strain of great mental endeavor; it must be mentally, not only intellectually, strong, but well balanced and stable; and above all it must abound in traits of moral and religious excellence, which seem to be the highest and latest development of the human race. When we consider the infinite plan unfolding steadily, unswervingly through years, millenniums, and ages—through periods of time incomprehensible to man—these high points of attainment in the moral and religious life mean more than their loftiest development in itself, however wonderful that may be; for they are the promise of more wonderful things to come, the foothills of which are now our greatest altitudes.

Nature has shown us the way. Not only has she laid emphasis upon the moral and religious life by placing it latest upon her great list of accomplishments, but she has definitely indicated that the instincts upon which it is founded are in the true line of progress. Those altruistic, self-sacrificing, life-giving instincts seem to have more survival value than the selfish, self-aggrandizing ones; the social animals which give up life for the members of the

flock or herd are inhabiting the earth, while the beasts of prey are doomed. Nature has crowned and honored these vital elements, and is pointing, in no uncertain way, to the moral and religious path as the road to progress and to security. The path may not always be clear, but the direction is plain.

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